TREES OF NOVA SCOTIA

A GUIDE TO THE NATIVE AND EXOTIC SPECIES

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PREFACE

To the stranger, a big city can seem the loneliest place on earth. Until you get to know your way around, the faces are just faces and the buildings are just buildings. It is the same with the world of nature. A field or a forest may teem with life. Yet until we really get to know these landscapes and their inhabitants, to us the field may be just a lot of grass and the forest just a lot of trees. It is our loss if we treat them as such.

We in Nova Scotia are notably rich in materials for nature study. Above all we are rich in *trees*. Forests cover eight-tenths of Nova Scotia's land area. Moreover, our ancestors had the foresight to plant many trees about our towns and farmsteads. Thanks to our mild climate, more kinds of trees thrive here than one might expect for these latitudes.

All this being so, we stand to gain much by learning more about our trees. After all, why should only those who work around trees be able to tell a white pine from a red pine, or a paper birch from a yellow birch? Such things should be part of the lore of our people and should be passed from one generation to another.

This is important, because bound up with a knowledge of trees is a knowledge of animals, of birds, of plants, and of insects. In a province such as ours, trees are often at the base of the life pyramid, as well as the economic pyramid.

For these reasons we offer this booklet to the public. We hope it will yield you many pleasant hours.

ACKNOWLEDGEMENTS

Handbooks tend to be heavy borrowers, perhaps on the grounds that by extending knowledge they help repay their debts. This handbook borrows heavily from six books in particular. Its basic information came from the Canadian Forestry Service's *Native Trees of Canada*, and from Harlow and Harrar's *Textbook of Dendrology*. Provincial tree ranges were found in Roland and Smith's *The Flora of Nova Scotia*. Some of the tree lore was sifted from Dr. William M. Harlow's excellent paperback *Trees of the Eastern United States and Canada*. Certain technical information was taken from the United States Forest Service's *Silvics of Forest Trees of the United States*. Facts about tree pests and diseases came chiefly from the Canadian Forestry Service's *Forest Insects and Diseases of North America*. These and other works consulted are listed in the bibliography. To their authors the writer acknowledges his debt.

A debt of another sort is owed the principal illustrator of this tree guide, Donald Pentz of Bridgewater. From 1964 to 1967 the completed manuscript lay stalled for lack of a competent local artist who could offer both a knowledge of forestry and the freedom to concentrate on months of drawing. Working from actual specimens whenever possible, and from standard texts when necessary, Mr. Pentz in one summer finished the bulk of the work.

The reader may wonder why, when several illustrated tree manuals are available, another should be published. The reason is that most such guides are too expensive, too technical or too general for the average person's needs. This hampers school children especially. At a time of quickening interest in Nova Scotia's forests, it seems appropriate to provide a tree handbook that tries to be inexpensive, simple and local, and which looks at trees from the forester's point of view.

In such an attempt there are sure to be slips and inaccuracies. The writer will be glad to have these brought to his notice.

G.L.S.
Truro, March, 1970

MAP OF NOVA SCOTIA

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INTRODUCTION

ANCIENT GIANTS

Look at a tree. It may be no older than oneself. Yet next to ferns, mosses and lichens it represents the most ancient family of plants now alive on Earth. Were we to represent the time span from the beginning of trees till now by a 1,000-page book (ie: about 2.5 inches thick), then the time elapsed *since* the pyramids were built about 4,000 years ago would be represented in that book by the *last line on the last page.* To endure so long, trees had to be more than just ordinary members of the vegetable kingdom — and so they are. They are complex, giant plants.

California's huge sequoias may tower more than 350 feet into the sky, and grow to be 30 feet across the butt. To grasp the magnitude of these dimensions, pace them off on the ground. Bristlecone pines of the southwestern United States attain the hoary age of nearly 5,000 years, and our own white pine may reach 450 years. The wood of Central America's lignum vitae is so hard that certain World War II vehicles rolled on bearings made from it. Balsa of South America is so light when dry that an armful weighs only a few pounds. And many trees, like our balsam fir, are so hardy that they will survive a century of harsh mountain-top weather.

GREEN FACTORIES

As factories trees are marvelous too. On a clear hot day an ordinary white elm may suck up and give off 1,500 gallons of water — a full load for an average tanker truck. Most of this the tree "sweats" through tiny leaf pores, which have shutters to control the rate of evaporation. As in humans, this evaporation prevents overheating, which would kill the leaves. All day the tree inhales through the same pores large quantities of carbon dioxide produced by oxygen-users such as engines, humans, wildlife and bacteria; and all day it exhales life-giving oxygen as a by-product. Night reverses these processes.

Water enters a tree by several hundred miles of roots embracing an area roughly equal to the area shaded by the crown. Rising steadily through a maze of tubes and valves that would baffle any plumber, the mineral-laden water reaches and continually bathes all living tissues in the trunk and crown. To this nutritious water the leaves add air and sunlight to make dextrose, a kind of sugar. From dextrose the tree then builds wood and bark, more leaves and twigs, flowers, seeds and so on. In other words, a tree is made *almost wholly out of water and thin air.* No human scientist has yet come close to performing this miracle, though scientists can change wood back into edible sugar.

HOW TREES GROW

Trees grow as long as they live, but in our latitudes they grow during only part of the summer. From late May to early August they rapidly produce a crop of leaves, twigs, roots, flowers, seeds, new roots, and a thin layer of new wood and

bark over trunk and limbs and roots. They also grow next year's crop of leaves and flowers, in miniature. Examine a live twig in midsummer. Note how the familiar winter buds are already formed, hidden in the angle above the leaf stem. They contain prefabricated flowers and leaves, all neatly telescoped and fused to burst at the sun's signal next spring.

These same buds are our most helpful feature for identifying leafless trees. Also, from the layers of wood or annual growth rings in the lower trunk we can read the age and much of the life-history of the tree.

WINTER PREPARATIONS After July or August trees prepare for ice and snow. That means converting dextrose back into various starches and fats for storage in the bark and roots. Usually by the first frost this job is done. The leaf-factories are shut down. As certain nutrients are withdrawn from the leaves of deciduous species, hitherto hidden colors appear; russet, gold, and scarlet. Soon the leaf stalks are sealed off, and autumn storms strip the trees. Our word Fall probably comes from this event. The fallen leaves, (if not raked away) provide valuable fertilizer for the tree, especially nitrogen.

Evergreens do not drop all their needles or markedly change color in the fall, but they prepare for winter in the same ways.

Thus, well before the snow flies our trees have entered a sort of hibernation or dormancy. In this state they can withstand great cold. Yet on very bitter nights a trunk will sometimes crack with a loud report, causing a vertical seam which usually heals into a furrow called a frost rib.

TREE FLOWERS AND SEEDS The flowers and seeds of trees deserve special mention. Not only are they interesting in themselves, but they are useful aids in naming unknown species. Tree flowers are mostly tiny — although the fragrant blooms on southern magnolia of the Gulf States may be eight inches across.

In this province the largest tree flowers occur on apple, cherry, and Juneberry. The most obviously colorful are the pink to white blooms of apple, locusts and horse-chestnut, and the orange-red blossoms of red maple. On a smaller scale, the claret cone-flowers of black spruce and tamarack are strikingly rich in color. But because most of the native trees depend on wind and not insects to carry the fertilizing pollen, plain little flowers are the rule. These flowers give off such clouds of pollen dust in May and June that the shores of woodland lakes are sometimes yellow with it.

Usually the same tree carries both male and female flowers, as in pines and oaks. Other species such as poplar, willow and ash bear male and female blossoms on separate trees: one tree is male, the other female. A few tree-flowers have the

male and female parts combined as in garden flowers. Cherry, elm, and linden are of this type. Catkins — drooping flowers that look like caterpillars — are typical of poplar, willow, birch and alder blooms of both sexes, and of the male flowers in oak.

Evergreens such as spruce and fir all bear flowers resembling little cones. The short-lived male flower is found on the lower branch tips; the reddish, often fragrant female flower grows higher up.

Upon fertilization the core of the female tree flower swells to accommodate the growing seeds. In most trees the seed matures the same year. In some, such as pine and red oak, it takes two years. Each ripe seed contains a small-scale tree enclosed in enough stored food to get it started in life. Some form of seed-wing is usually provided also, to buoy it on the wind. This gives the seedling a chance to grow outside the full shade of the parent tree. Drop a spruce or elm seed from an upstairs window in a breeze and watch it spin and sail downwind.

Most trees produce bumper crops of seed only every few years. Birds, animals, insects and disease destroy millions of tree seeds; but normally there are plenty left to provide for young trees.

LEAF-OUT

As spring days lengthen the tree breaks dormancy. The sap stirs again. Stored foodstuffs are changed back to sugar and rushed up to the buds in the sweetish and free-running sap. Those who tap sugar maples in March or April take advantage of this. The sugar-laden sap provides fuel to run the tree factory until the leaves can start making their own. Trees run on sugar the way cars run on gasoline; but unlike cars, trees make their own fuel, and burn it more slowly. And very potent it is: from winter buds the size of rice grains a black ash can throw out 16-inch leaves in a fortnight.

Once the leaves and flowers are out it is time for the novice tree student to be out as well.

GETTING TO KNOW OUR TREES

THIRTY NATIVE TREES

In Nova Scotia there are some 30 different kinds of native trees, with softwoods making up about 70 per cent of total volume. Twelve kinds supply all our industrial wood. Counting *exotics*, or species introduced from other countries, we have about 45 kinds. If we add native and foreign shrubs that reach tree size, the total comes to around 60.

For the purpose of this booklet, a tree is defined as any self-supporting plant having a single woody stem 10 or more feet tall. Admittedly this is small for a tree. But it lets us include several kinds of near-trees that are commonly seen, and which are sometimes mistaken for larger relatives.

Getting to know several dozen trees may at first seem hard to do. But it is easier than one might think. After all, most of us know and can quickly recognize more than 60 people — and people, as a rule, are more alike than trees. People seem easier to tell apart because they are inherently more interesting.

It is true that trees are not much fun to talk to, though lonely trappers sometimes do it. But for those who take the trouble to really look, they can become fascinating objects for summer and winter study. In fact, many people make tree study (or *dendrology*, from Greek *dendron*, a tree), a life-long hobby. Others want merely to be able to recognize the trees they come across while walking or working or driving. Between these extremes is a large body of people whose zeal is less than the hobbyist's but more than the casual onlooker's. We hope this booklet will aid all three groups.

Whatever the reader's own degree of interest in trees, he or she will find this guide much more useful by forming a habit of taking it along wherever or whenever new tree species are likely to be encountered: family outings, hunting and fishing expeditions, hiking jaunts, and walks in the local park. Nor should it be left home during out-of-province trips. Although the booklet describes trees native to Nova Scotia, most of those species range widely over North America. Meeting a familiar tree a thousand miles from home is nice.

In our towns the exotic species most often seen are elm, maple, linden and poplar, followed by species such as birch, rowan, French willow, horse-chestnut, English oak and black locust. In our forests the common ones are fir, spruce, pine, hemlock, birch, maple, aspen and oak. More rarely, such native forest trees as hornbeam, witchhazel and cedar will be encountered.

The first step in getting to know any of them is to lump or group those with common features. This requires a knowledge of those features, so that they can be compared and contrasted to arrive at identities. Then the groups can be split into individual species. Lumping and splitting is the theme of the next section.

GROUPING TREES FOR STUDY All Nova Scotian trees fall into two groups: *Needleleafed** (eg: fir) or *broadleafed* (eg: maple). Because needleleafed species always bear their seeds in *cones*, hold their leaves for two or more years (except tamarack) and usually have fairly soft wood, they are likewise called *conifers, evergreens, or softwoods;* conversely broadleafed trees are usually termed hardwoods, and described as deciduous (Latin *de cadere*, to fall off). Most people are familiar with one or more of those terms.

LEAF CLUES If the reader will examine a dozen different needle-leafed trees he will see that they come in two basic types: those with needles in bundles (eg: pine, p. 16), and those with needles one-by-one (eg: spruce, p. 24). The broadleafed species also come in two kinds: *simple*, one-piece leaves (eg: birch, p. 48), and many-parted or *compound* leaves made up of several leaflets (eg: ash, p. 84).

To know whether one is looking at a compound leaf or just a cluster of simple leaves, one need only check the stalk to which they are attached. If it is fleshy, the leaf is compound; if woody, it is simple. After July one can also separate leaflets from true leaves by the presence of a bud at the base of each leaf.

The conifers are easier to learn. Not only do they change little from summer to winter, but there are only 10 of them (unless we count a few exotic species). By learning some individual features of needles, twigs, cones and bark, one can master them easily. The hardwoods are less easy, and there are three times as many. So we must sub-divide them further.

KINDS OF HARDWOOD LEAVES Of the simple-leafed species there are again two kinds, namely *lobed* or partly divided as in maple (p. 76), and *unlobed* as in birch. Both kinds may have sawlike or *toothed* edges of varying kinds, which can be quite useful in placing new specimens. Flip through the broad-leaf section of this booklet and note the several kinds of teeth or serrations. Their purpose may be to shed rain evenly.

One caution to observe is that leaf samples taken from saplings or from trees in deep shade are apt to be larger than normal, and not typical in shape.

Of compound-leafed trees, the native species all have the *pinnate* form, ie: with leaflets arranged in a feather pattern (Latin *pinna*, feather) along a central stalk. The same applies to most of our introduced trees. One exception is horse-chestnut, which has a finger-like or *palmate* arrangement of leaflets (p. 90).

Other leaf features, such as hairiness, vein pattern, texture, and size will be described in the main text.

TWIG CLUES Now we turn from summer to winter conditions. Unlike the evergreens, the hardwoods now present a confusing maze of leafless twigs. This

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**Except for one native evergreen, cedar or arbor vitae, which has overlapping, scale-like leaves instead of needles (see p. 34).*

to most people makes hardwoods a closed book until the next summer — except perhaps for birch and beech, which they can tell by the bark. Yet the fact is that hardwood trees are as easy to name in January as in July. Their twigs may look all alike at first glance; but so does a herd of Hereford cattle to the average non-farmer. A closer look reveals many distinctive features.

Moreover, twig features are more reliable than leaf features. Even on the same tree, leaves vary not only in size, but in shape (no two identical leaves have ever been found), in color (soil and season affect this), in texture, and in other ways. Certain species are notorious for this. Twigs vary too, but not so noticeably. This makes their features easier to learn.

Twigs come in many colors and kinds: red, yellow, purple, brown, green and grey; stout and slender, rough and smooth, zig-zag and straight. Some have buds in opposite pairs; others have them alternating or staggered.

The buds themselves also have distinctive qualities. They may be blunt or pointed, large or tiny, shiny or furry. Most are covered by many overlapping shingle-like scales (eg: elm, p. 60), others by just one scale (eg: willow, p. 47).

Anyone can spot a beech, for instance, by its rich brown, spindle-shaped buds. Balsam poplar also stands out in winter because of its large, resinous, aromatic buds. Horse-chestnut is easier still, because it displays the marks of perfect horseshoes, nails and all, on its stout twigs. And so on. The branch pattern of the tree itself can be helpful in some species, since it reflects the bud pattern of the twigs from which the branches grew.

So there is no need to let winter halt one's study of trees. But for the beginner, summer is the most pleasant time to start.

SPLITTING THE GROUPS INTO SPECIES Having lumped the trees by general features we can now proceed to split the main groups into species. That is what the main text is about. What follows is a table bringing together the summer features we have been describing. (For softwoods the same features apply in winter.) This sort of table is called a *key*. There are many types of plant keys. Like real keys, they employ a process of elimination to open the way to what is sought, which in this case is the identity of the plant.

Normally a plant key narrows the choice right down to a single species or group of species. Such keys require some knowledge of botany. But because we are dealing with trees only, and because there are relatively few species, our key can be much simpler. All it need do is ask the reader for certain facts about the specimen at hand, then tell him or her where in the handbook to look for likely candidates. The drawings and descriptions on the pages indicated should soon lead to the correct species.

Below are two keys, one using leaves, the other using winter twigs. For twig study a 10X hand lens and a sharp pen knife are useful.

LEAF KEY

TREES WITH NEEDLE-LIKE OR SCALE-LIKE LEAVES

Needles in bundles

Two needles per bundle ..... see pp. 17-20

More than two needles per bundle ..... see pp. 15, 22

Needles solitary

Needles flattened ..... see pp. 30-34

Needles four-sided ..... see pp. 24-28

TREES WITH THIN, FLAT LEAVES OF VARYING WIDTHS

Leaf simple

Leaf lobed ..... see pp. 58, 76-83

Leaf unlobed ..... see pp. 40-56, 60-68, 72, 73, 89

Leaf compound

Leaf pinnately compound

Eleven leaflets or fewer ..... see pp. 84, 86

More than eleven leaflets ..... see pp. 70, 74, 86, 90

Leaf palmately compound ..... see p. 90

HARDWOOD TWIG KEY

BUDS OPPOSITE (PAIRED)

Leaf scars* with 3 dots only, twig usually reddish to purplish

Buds stalked, with only 2 visible scales 80, 81

Twigs and buds hairless, bark white-striped 81

Twigs and buds white-downy, bark not striped 80

Buds not stalked, with several visible scales

Buds sharply conical 76

Buds blunt-tipped

Twig slender, tip bud usually less than 1/5" long 78, 82

Twig stout, tip bud usually more than 1/5" long 83

Leaf scars with about 16 dots, twig greenish to greyish 84-88

Leaf scars shaped like horse's hoof print, twigs very stout, buds gummy 90

---

*Leaf scars are found just under the buds. Each scar marks the place where a leaf stalk parted from the twig the previous autumn. The dots found on the leaf scars of many species are the cut ends of tiny bundles of sap tubes. Because different groups of species have characteristic numbers of bundle-dots, the dots make useful identification features.

BUDS ALTERNATE (STAGGERED)

Thornes or spines present 73, 91

No thorns or spines present

Buds on a short stalk 55, 62

Buds not stalked
Buds scales 1 or 2 ..... 47, 89

Bud scales 3 or more
Twig distinctly zig-zag
Buds cigar-shaped, 1/2" long to 1" long 56

Buds not cigar-shaped, mostly under 1/2" long
Twig with wintergreen taste 48

Twig without wintergreen taste
Bark papery, whitish 50, 52, 53

Bark brownish, not papery 54, 60

Twig more less straight
Twig very stout 74

Twig not as above
Twig with star-shaped pith (core) when cut across
Buds and twigs fuzzy 44

Buds more or less fuzzy, twig hairless 42, 58

Buds and twigs hairless
Buds very resinous, aromatic 44

Buds not as above
Buds dark brown, very shiny 40

Buds yellow-brown, not shiny 46

Twig with circular or oval pith when cut across
Buds grey-downy 68, 70

Buds hairless
Twig stout, buds large and resinous 70

Twig slender, buds not large or resinous
Buds pinkish, narrow and sharp-pointed, scales unequal in length 72

Buds not as above, scales of nearly equal length
Twig reddish brown 66

Twig grey-brown to dark brown
Twigs reddish-brown, glossy, buds about 4 mm long 64

Twigs dull grey, buds about 6 mm long 68

THE SOFTWOODS

INTRODUCTION

Our native softwoods or conifers are 10. In order of volumes present,* they are: spruce (red and black), balsam fir, white spruce, white pine, hemlock, tamarack, red pine, jack pine, cedar.

In addition several introduced species are often seen, notably scotch pine, Austrian (black) pine, Norway spruce, European larch, and Colorado blue spruce.

Pines are perhaps our best known softwoods. Their bundled needles and large cones set them apart. White pine is of the five-needle or Soft Pine group, while the other two (plus the introduced ones) are of the two-needle or Hard Pine group. White and red pine are both important native lumber trees. The foreign pines have been widely planted for reforestation and decoration.

All pines, especially jack and red pine, do best on sandy soils. In Nova Scotia pines are most plentiful in the western half of the province, becoming scarcer toward Cape Breton. Jack pine, which tends to follow fire and cutting on poor soils, is the smallest and scarcest of the three, white pine the largest and most abundant.

Spruces are becoming our most valuable softwoods, because their long-fibered, whitish wood is perfect for making newsprint. Unlike the pines, they have short, single needles. Their cones are smaller too. Red spruce, the most common of the three, is also our most important conifer. Black spruce is usually found in swamps and along the coast, and white spruce (to which Norway and Colorado spruce are similar) has earned the title of pasture spruce by its habit of taking over abandoned farmland.

Balsam fir is familiar and beloved as the most popular Christmas tree species of the northeast. Fir is also Nova Scotia's most common conifer. Though not as valuable as red spruce for timber, it is a major pulpwood species. Its name comes from the clear, aromatic resin found in blisters on the bark.

Hemlock is a graceful tree with shiny needles that are smaller than those of other native conifers. An extract from its rough reddish bark was once used in tanning leather. Since good white pine became scarce, this conifer has become more important for lumber. Look for it on sheltered, moist slopes with pine and red spruce.

Tamarack is unmistakable among native conifers, with its soft grey-green foliage that turns gold and falls in autumn, and its small, rose-shaped cones. This tree keeps company with black spruce on swampy ground, and its wood is the hardest among our native softwoods.

Cedar is another moisture-loving tree. In Nova Scotia it is very scarce, and practically confined to the western counties. The flattened, scalelike needles differ from those of all other native conifers.

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*As of 1975-82 Provincial Forest Inventory

This tallest and most stately of eastern softwoods has been prized in Nova Scotia since long before Halifax was founded. After the first sawmilling rig was set up near Riverport in Lunenburg County around 1632, white pine was eagerly sought and cut, first for home construction, and later for shipbuilding and export. To protect her New World sources of masts and spars, Britain had surveyers blaze prime trees with the Broad Arrow.

Since the 1800's, scarcity of large old-growth stands in the province has brought red spruce and other softwoods to the fore as lumber trees. But white pine is still much used here, and in the Northeastern and Lake States it remains the most important conifer. The tree matures in 200 years but may reach 450.

This native of the Appalachian and Great Lakes regions is found throughout Nova Scotia, but is most common in the western half. Formerly its best development was on sandy or gravelly soils in Shelburne, Cumberland and north Colchester Counties, and in Annapolis Valley. It grows in pure stands or mixed with red spruce, hemlock, yellow birch and sugar maple. Although white pine grows largest in such mixtures (up to four feet across and over 100 feet tall), it is found also on bogs with black spruce and tamarack, and on dry sandy ridges with Jack and red pine, probably as a result of fire. It tolerates some shade.

The tree is threatened by white pine blister rust, a fungus which causes swollen orange-coated branches, abundant resin drippings, a dead top, and eventually death. The spores that infect the pine develop on the leaves of gooseberry and currant bushes (*Ribes* species), whence they can travel up to 1,000 feet by wind to the nearest white pines. By rooting out all *Ribes* plants within that range, the pines can be protected. Only five-needle pines are susceptible.

The white pine weevil also does much damage by riddling leading shoots. This results in forked and crooked trunks that are often useless as logs.

According to Josselyn, an early English writer, "the distilled water of the green cones taketh away wrinkles in the face, being laid on with cloth."

White-tailed deer eat the needles and twigs, and red squirrels and crossbills extract the large seeds. Dense young stands make good windbreaks and wildlife cover, but older stands become too open to give much shelter.

A TALL OFTEN SPREADING FIVE-NEEDLE CONIFER WITH CIGAR-SHAPED TAN CONES AND NEARLY HORIZONTAL UPPER BRANCHES WITH UPCURVED TIPS; THE TOP OFTEN BENT PERMANENTLY TO LEEWARD BY WIND, AND FLATTENED.

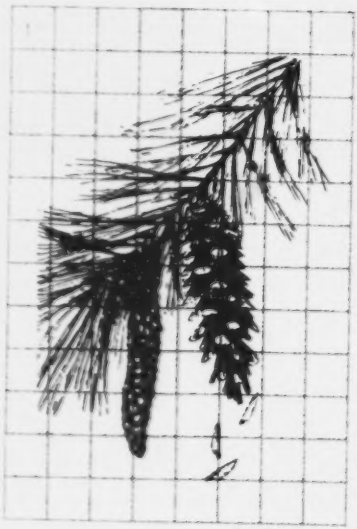
Needles On older twigs in bundles of 5 (think of W-H-I-T-E), singly on new shoots; 3" to 5" long, 3-cornered, slender, soft, blue-green.

Cones Pendent, longer than those of other native pines, stalked, cigar-shaped when closed, resinous, often slightly curved. Scales thin, bearing two 1/4" winged brown seeds that ripen in September of second year.

Twigs Slender, changing from green and downy at first to orange-brown and smooth; roughened by scars as needles drop; buds sharp-pointed.

Bark On young trees smooth, dark green or brown-tinged (somewhat fir-like but without resin blisters); older trunks dark grey and deeply furrowed into broad up-and-down ridges. Up to 3" thick.

Wood Highly prized for interior finish. Straight-grained, even-textured, durable, light-weight; taking nails, planing and painting very well. Sapwood creamy white, heartwood pinkish; distinctly fragrant. Growth rings faint, but the dark dots and lines of the resin tubes are easily seen, and serve to separate it from the woods of red and Jack pine. Air-dry weight about 24 lbs./cu. ft.



Red pine is only a scattered tree in Nova Scotia, being found mainly in sandy and rocky soils on the lowlands of Colchester and Cumberland Counties, and in northern Queens and southern Annapolis Counties. The natural range of red pine centers on the Great Lakes, but extends from Newfoundland (a few pockets) to southeast Manitoba. It is found both in pure stands and mixed with white or Jack pine. Jack pine tends to replace it after cutting or fire, unless special measures are taken to encourage the red pine seedlings; so this useful species may in time become scarcer.

The sturdy wood and ease of rot-proofing make it ideal for wharf and bridge pilings, hydro poles, and the like. It is also valued for reforestation, since it plants well and grows rapidly. Plantations produce valuable logs because natural pruning of lower branches is good in this species, resulting in knot-free lumber. Red pine was once used for shipmasts, and the heartwood was selected for ships' decks.

In plantations some damage is done by the European pine shoot moth, the white pine weevil, and the pine root collar weevil.

The name "Norway Pine" may have originated with early Great Lakes voyageurs who mistook it for Old World Norway spruce, or from large stands which grew near the village of Norway, Maine.

In 1971 the *Scleroderris* canker of pines was discovered in New Brunswick. The next year it was found in a 15-year-old red pine plantation in Pictou County. Most pine species are susceptible to attack by this fungus, especially young plantations of red pine and Jack pine in frost-prone areas. Symptoms include yellowing of branch tip foliage and dying of tip buds.

A TALL, STRAIGHT, TWO-NEEDLE PINE WITH PLATY RED-BROWN BARK, AN OPEN OVAL CROWN OF TUFTED APPEARANCE, AND LONG YELLOW-GREEN NEEDLES THAT BREAK CLEANLY WHEN DOUBLED BETWEEN THE FINGERS.

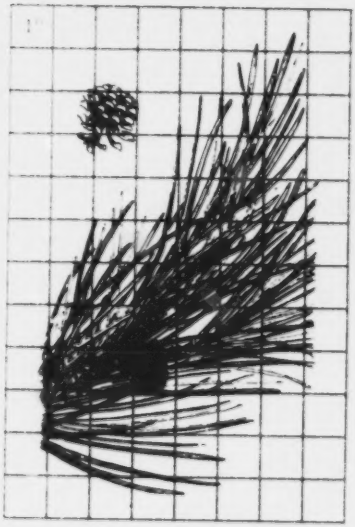
Needles In 2's (also rarely in 3's on shoots infested with grubs of the pine shoot moth), 3"-5" long, dark, shiny, yellow- green, straight, not twisted as in Jack pine. The clean breakage noted above usually serves to separate red pine from introduced species such as Austrian and Scots pine, whose needles are less brittle.

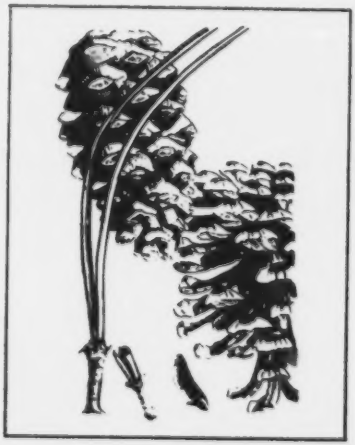
Twigs Twigs: Stout, rough, orange to red-brown; buds sharp-pointed, resinous, a bit hairy.

Cones Oval, maturing in two years; small and upright the first autumn, hanging and chestnut-brown the second, when they open to release the winged seed; falling the next spring; scale tips more or less rounded (angled in Scots pine), two seeds per cone scale; cone not curved or pointed as in Jack pine.

Bark Orange-brown and flaky on young trees, later breaking into flat red-brown plates.

Wood Yellowish to reddish with a pronounced grain. Lightweight, straight-grained, heavier and harder than white pine; takes creosote very well, has fine dots in growth rings. Air-dry weight about 28 lbs./cu. ft.





The range of Jack pine is the largest of any native Canadian pine, extending from Cape Breton Island in the east to the Yukon in the west, and from the northern tree line to the Lake States. In closed stands on good soils it may reach 80 feet tall and two feet in diameter. But on the poorer and drier sites where it is commonly found it seldom exceeds 50 feet tall and a foot in diameter, and may be stunted and scrubby. Its best development is in the region around Lake Superior.

In Nova Scotia it is nearly as scarce as cedar. Scattered stands are found on sandy, barren or ill-drained soils here and there, notably near the isthmus between New Brunswick and Nova Scotia. It is rare in the Annapolis Valley.

Nevertheless, Jack pine may spread in the province, because it can take over poor sites recently cleared by fire or cutting, provided seed trees are present. This species usually grows in pure stands, but may be found mixed with black spruce and such post-fire hardwoods as white birch and aspen.

Being scarce and of small size (except in favored locations), Jack pine is unimportant to our forest industry. Sometimes it is used locally for fuelwood and round timber for rough jobs. In central Canada, where it occurs in extensive pure stands of larger trees, it is used for lumber, railway ties, poles and Kraft pulp (eg. for shopping bags).

Some of the early settlers believed that this pine poisoned the soil — no doubt because of its abundance on poor sites. There was also a superstition among them that it was a "witch tree", and not to be tampered with.

INTRODUCED PINES

Among imported pines the most common is Scotch or Scots pine (*P. sylvestris* L.). This large and important timber tree of Europe has been widely planted in North America — sometimes with poor results due to bad seed sources and infection by the sweet-fern blister rust fungus. Two other introduced pines sometimes seen are another Old World timber tree, Austrian pine (*P. nigra* Arnold), and Mugho pine (*P. mugo* Turra var. *mughus* Zenari), a dwarf form of the mountain pine. All three are two-needle pines.

The distinctive features of Scotch pine are its orange-brown bark and twigs, half-round, sharp-pointed needles (about 2 $^1/_2$ inches long); and its tapered two-inch cones with their raised, angular cone scales. Austrian or black pine has very dark green needles about five inches long. The foliage looks dense and dark at a distance. Mugho pine is used for ornamental planting only.

A SMALL TO MEDIUM-SIZED TWO-NEEDLE PINE OF GENERALLY RAGGED OUTLINE WITH TWISTED YELLOW-GREEN FOLIAGE AND CURVED CONES.

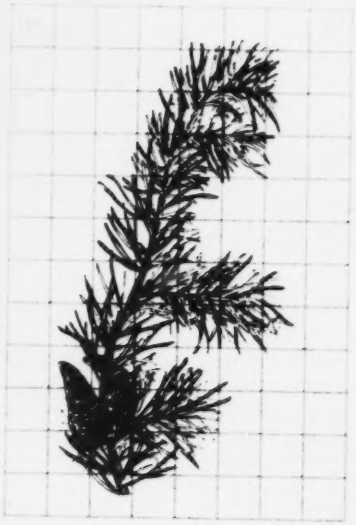
Needles In 2's, $^3/_4$" to $1^1/_2$" long, each pair usually twisted and spreading apart; light yellow-green, stiff; shorter than those of other native pines; flattened (instead of semi-circular or triangular) in cross-section.

Twigs Slender, tough, smooth, yellowish green; buds reddish brown, rounded.

Cones Yellowish-brown, thick-scaled; maturing September of the second year (first-year cones small and oval); usually incurved toward branch tip, often borne in pairs, remaining closed on tree for many years (sometimes even being overgrown by branch wood); bearing two winged seeds.

Bark Similar to that of black spruce; thin, reddish brown to dark grey, becoming scaly and furrowed on old trunks.

Wood Creamy white to brownish yellow with fairly distinct growth rings showing faint light dots; fairly hard but not strong, fairly durable under exposure, creosotes well. Air-dry weight about 31 lbs./ cu. ft.



Tamarack is unique among native conifers in that each fall it sheds its foliage like the hardwoods. It also ranges more widely than most North American conifers, being found from Newfoundland and Labrador to the interior of Alaska. Its northern limits follow Hudson's Bay and the tree line; southward it reaches into the Lake States. In Nova Scotia it is found throughout, but never abundantly.

A fast-growing tree that tolerates no shade, this species is often forced by shade-tolerant species to inhabit poor open sites such as peat bogs and swamps. The lowlands of Guysborough County, for instance, are characterized by mixtures of tamarack, black spruce and red maple. However, it does best on drier sites, where it grows up to 70 feet tall and nearly two feet in diameter.

In our ship-building days of the 1800's "juniper" was so eagerly sought that the limited stocks of larger trees were depleted. One special use was for ship knees (i.e.; angled pieces cut from roots bent by contact with rock or hard soil) for joining ribs to deck timbers. When suitable tamarack could not be found spruce roots were used.

Boatbuilders still use tamarack to make the curved bow piece that fastens to the keel to receive the forward planking; here strength is essential. But today tamarack is cut chiefly for fence posts, poles and ties. The wood is said to last over 15 years underground without preservatives. Most softwood posts rot within three years. As a fuelwood its great heat and creosote content are hard on stoves and stove pipes.

Rabbits like the needles, and ruffed grouse and other birds eat the seeds. The branchlets are sometimes browsed by deer. Porcupines seem to prefer its bark to that of most other softwood species. The tough roots, like those of the spruce, were used by Indians to sew birch bark. The name "juniper" properly belongs to the true juniper (*Juniperus* spp.), a creeping shrub with sharp needles and bluish, berry-like cones.

The worst insect enemy of this tree is larch sawfly, which killed whole stands from Nova Scotia to Manitoba around 1900. Moderate to severe infestations of this leaf-eating pest usually persist in Nova Scotia.

Note: A similar tree, European Larch (*L. decidua* Mill.), is often planted here. It has yellow-green foliage, larger cones, stout yellowish twigs, and thicker, platy bark.

A SMALL TO MEDIUM-SIZED TREE WITH SPIRE-LIKE, OPEN CROWN AND LONG STRAIGHT TRUNK, SOFT BLUE-GREEN DECIDUOUS FOLIAGE IN SMALL CLUSTERS RESEMBLING WHISK BROOMS; AND SMALL UPRIGHT CONES.

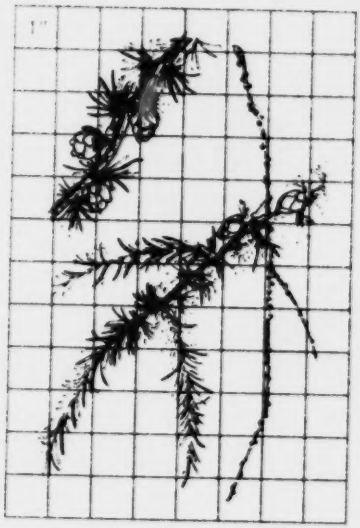
Needles Soft, blue-green (turning gold and falling in autumn); in clusters of 12 to 30 on older twigs, but singly on new shoots; 3-cornered, 3/4" to 1 1/4" long.

Twigs Orange-brown, slender; with numerous short spur shoots after first season, giving them a knobby appearance in winter; buds small, round, dark shiny red.

Cones Upright, short-stalked, thin-scaled, light brown, resembling a miniature, oblong rose; opening to drop seed the first fall, falling the second season; bearing two winged seeds per fertile scale.

Bark Thin; in young trees a smooth bluish-grey, later red-brown and roughened by fine scales.

Wood The heaviest and hardest of native softwoods; white to yellow-brown and more or less oily; often spiral-grained (ie; splitting lengthwise in a spiral); quite durable under moist conditions. Air-dry weight about 35 lbs./ cu. ft.



This is our most valuable lumber and pulpwood species. Other uses include general construction, boxes and crates (because it imparts no taste to foods), boat-building, and ladder stock (where cross-grained wood is unsafe). The wood is often sold with the other two spruces as "spruce". On good sites it grows to 90 feet tall and one to two feet in diameter. Normally the trunk is straight and fairly free of dead branches.

After balsam fir, red spruce is the most common softwood in this province, predominating in all but the Cape Breton uplands, and in western Nova Scotia. Nova Scotia's cool, moist climate is ideal for this spruce, which also thrives in Prince Edward Island, New Brunswick and the New England States, and ranges south in scattered pockets through the Appalachians to Tennessee. In Nova Scotia it occurs both in extensive pure stands (as around Amherst), and mixed with various hardwoods and softwoods.

Though red spruce will grow on swampy soils with such species as black spruce, tamarack and red maple, it does best on well-drained soils with yellow birch, sugar maple and beech. It can stand moderate shade. Because it inter-breeds with black spruce, positive identification is often difficult.

The small branches make a good, springy mat to place under balsam fir boughs when making a camp bed. (Place the spruce under-side up, the fir face up). Guitars and other instruments with "spruce" sounding boards usually contain this wood, since it has good resonance properties. Spruce beer, a former remedy for scurvy, can be made by boiling new twigs and needles, adding molasses, honey or maple sugar, and fermenting.

Red spruce has the ability to survive for decades in the dim light under other trees. But for best growth it requires nearly full light, a fact demonstrated on good sites by the remarkable surge of growth that normally follows release from shade. Under good conditions it reaches sawlog size in 60 years, but commonly lives to 200 years (max. about 400). Spruce budworm, which is mainly a pest of fir, can be a serious enemy where fir forms a large proportion of the stand. Some damage is caused in coastal areas by dwarf mistletoe. Balsam fir sawfly sometimes attacks it, the spruce bark beetle is a serious enemy of old stands, and porcupines like the bark. Windstorms cause some damage because of the shallow roots.

A MEDIUM-SIZED EASTERN CONIFER, NORMALLY WITH DENSE YELLOW-GREEN FOLIAGE OF SHARP, 4-ANGLED NEEDLES, NARROW CONICAL CROWN, REDDISH SCALY BARK, AND LOWER BRANCHES THAT USUALLY DROOP; OFTEN HARD TO TELL FROM BLACK SPRUCE.

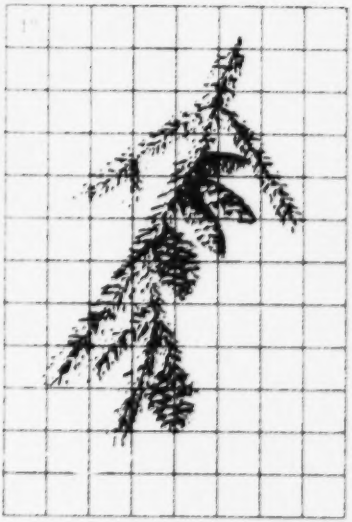
Needles Four-cornered (to test this, roll one between thumb and forefinger), $^1/_2$" to $^5/_8$" long, bright yellow-green, sharp-pointed, attached to tiny pegs (part of the twig, not of the needle as in fir and hemlock), and growing all around twig with a tendency to curve toward upper side. Generally longer than black spruce needles.

Twig Orange-brown, slightly hairy, rough when needles removed.

Cones Pendent, green to purplish-green in September, turning reddish brown and opening the first autumn to release two winged seeds per fertile scale, falling in winter. Cone-scale edges nearly smooth (slightly ragged in black spruce, quite smooth in white spruce).

Bark Finely scaly, thin, reddish brown; inner black brownish yellow.

Wood Nearly white to pale yellowish brown, lightweight, straight-grained, fairly strong; grain slightly more pronounced than in white or black spruce. Faint resin tube dots visible in outer parts of growth rings. Without distinctive odor. Air-dry weight about 28 lbs./ cu. ft.



This species has a North American range slightly exceeding that of tamarack, and is the third most plentiful of Nova Scotia's softwoods. Its habit of taking over abandoned farmland (especially in the Annapolis Valley and the lowlands of Cape Breton) is increasing its abundance. White spruce is our fastest-growing spruce, thriving on the moist, well drained soil along streams and lakes, and common on sandy soils along the coast. Although most commonly found in pure stands, it may occur mixed with other spruces, balsam fir, tamarack, white birch and aspen.

Pulpwood is its chief use, followed by lumber, boxes, crates, and general construction. Straightness of grain accounts for its use in organ pipes and arrows. Its springiness also makes it useful for scaffolding, ladder rails, and rough flooring. When seasoned the odorless wood is ideal for food containers. Reforestation is another common use.

The Indians dug its long pliable roots for sewing birch bark on canoes and for decorating baskets. To prepare the slender roots they steamed coils of them for an hour or so in hot wood ashes, then removed and split them. Just before use, the roots were soaked in hot water. Examples of such spruce-root handicrafts can be seen in museums such as the Citadel Museum, Halifax.

Although some people use white spruce for Christmas trees, its value is lowered by the rank odor. Moreover, like other spruces it quickly sheds its needles indoors unless the butt is placed in water.

The chief insect enemy of white spruce is the eastern spruce sawfly, which infested some 12,000 square miles of white and black spruce stands on the Gaspé Peninsula in 1938. But normally populations of this insect in Nova Scotia are low. Here the spruce budworm and spruce bark beetle do the most damage. The yellow-headed sawfly also does mild damage here and there in the province. Squirrels sometimes snip off shoots, and porcupines eat the bark.

A SPIRE-LIKE, BRANCHY CONIFER OF MEDIUM SIZE WITH ASHY-BROWN, SCALY BARK, LONG NARROW CONES, AND SHARP 4-ANGLED BLUE-GREEN NEEDLES WITH A RANK ODOR WHEN CRUSHED.

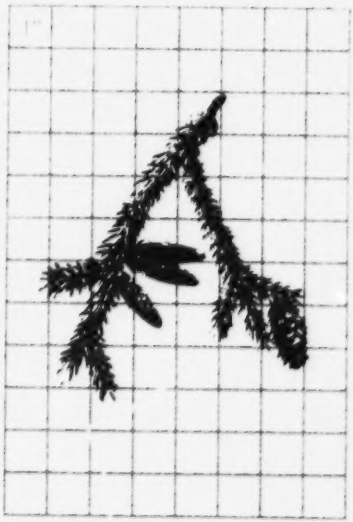
Needles Four-cornered, 1/3" to 3/4" long, sharp-pointed, blue-green; mounted spirally on little pegs and usually crowding toward upper side of twig; emitting a rank, sometimes unpleasant odor when crushed.

Twigs Mostly hairless, orange-brown to whitish grey; rough when needles removed.

Cones Pendent, longer than those of red or black spruce, cone scales completely smooth-edged, bearing 2 winged seeds each; pale green, turning brown and opening the first autumn, falling in winter.

Bark Thin, scaly, ash-brown to silvery; inner bark streaked with rust-brown layers.

Wood Nearly white to pale yellow-brown, with faint white dots; lightweight, soft, straight-grained, strong in bending, good resonance properties; takes a good finish. Air-dry weight 26 lbs./ cu. ft.



Black spruce, a cross-Canada species with a range like that of white spruce, is fourth in order of abundance among conifers in Nova Scotia. Its main use is for pulpwood (where its denser wood means more usable fiber per cord) and for mine timbers. Where small size is not a limiting factor it is used in rough construction.

This tree is found throughout the province, but chiefly on poorly drained soils along the Atlantic and Fundy coasts. Its most common associates on the better soils are balsam fir and white spruce, and tamarack on bogland. On exposed bogs or rocky headlands it survives in low, stunted forms that may be over a century old.

As many a child knows, black spruce yields about the best chewing gum of any of the spruces. Find where resin has oozed from an old wound and hardened. With a pocket knife, pry the brownish lumps loose and scrape them clean. Bite once or twice, and soften the granules in the mouth before chewing. If the gum is "ripe" it should soon turn pink.

From this tree spruce beer can also be made, as outlined under red spruce. Fishermen sometimes used an extract of the boiled cones to preserve and darken nets, and they still prefer the wood for making lobster traps because it outlasts fir. They make the curved frame by bending the tough branches into shape, and they saw the laths from specially cut black spruce bolts. Sometimes they even fashion the circular entrance hoop from a black spruce branchlet — although young maple or birch is more commonly used.

Black spruce commonly grows new trees by rooting its lower branches in wet moss. It is also one of the first conifers to follow fire, since its sealed cones open best after heat (see Jack pine). The tree matures after about 80 years (max. 200) of usually slow growth.

Its enemies here are few. The balsam fir sawfly causes a moderate loss of foliage in some locations. Rabbits sometimes destroy seedlings, and porcupines eat the bark. Moose and deer seldom browse it, however.

INTRODUCED SPRUCES

Of the introduced spruces the most common are Norway spruce (*P. abies* (L.) Karst.) and Colorado blue spruce (*P. pungens* Engelm.). Both have much larger cones than any of the native species. Also, Norway spruce is distinguished by the drooping habit of its lower branches, and blue spruce by the striking misty blue-green color of its foliage.

A SMALL TO MEDIUM-SIZED TREE WITH BROWN, EGG-SHAPED CONES, HAIRY BROWN TWIGS, 4-ANGLED NEEDLES, A STRAIGHT SLENDER TRUNK, AND A CONICAL CROWN OF SHORT BRANCHES WHICH IN OLDER TREES DROOP AND CARRY NUMEROUS OLD CONES.

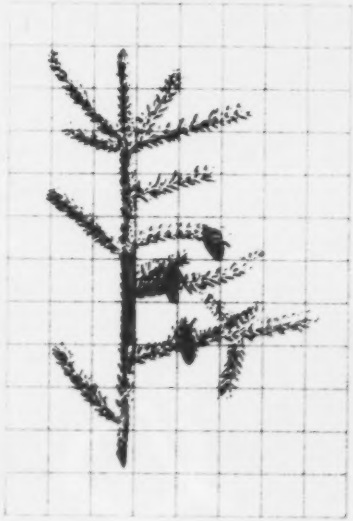
Needles Blue-green, 1/4" to 1/2" long, 4-cornered, blunt-pointed on stunted trees, spirally mounted on tiny pegs, sometimes curving to upper side of twig.

Twigs Brownish, hairy, otherwise quite similar to those of red spruce.

Cones Pendent, shorter than in other spruces, with scales always rough-edged; purplish the first winter, borne on the tree for many years both before and after opening.

Bark Thin, greyish or reddish brown, the inner bark usually olive-green (compare red spruce).

Wood Nearly white to pale yellow-brown, with faint dots in the outer parts of growth rings; denser and stronger than the other spruces (30 lbs./ cu. ft.); prone to warping unless very carefully seasoned.



Although we now regard hemlock as an important lumber tree, early lumbermen passed it by for the more valuable white pine. Eastern hemlock is found from Nova Scotia westward to Minnesota and south to Tennessee. In this province it is nowhere plentiful, growing mostly in local patches along rich north slopes and ravines, mixed with white pine, red spruce, yellow birch, and sugar maple. However, Queens, Digby and Annapolis counties once had extensive almost pure stands. Remnants of these remain here and there, with some trees attaining four feet in diameter at chest height. South-western Nova Scotia has the best hemlock areas; Annapolis has been called the "hemlock county".

While hemlock wood can be dressed for interior work, it is more often used in rougher work such as bridge planks, sills, boxes and crates, treated railway ties, culverts, and beams. Because this species retains its lower branches for many years, its wood is usually knotty. These knots probably contain the hardest wood of any eastern tree. They can nick an axe blade easily. Hemlock is dangerous in camp fires, because it throws out more sparks than the wood of any other native conifer except perhaps cedar.

Young hemlock (often called "white hemlock") are very graceful, easy to transplant, and make good ornamentals. Responding well to clipping and trimming, they also produce excellent hedges. An oddity of hemlock is that its main branches grow not in regular groups or whorls, but in a staggered pattern.

The somewhat similar "ground hemlock" is not true hemlock, but a native yew (*Taxus canadensis* Marsh.). The famous hemlock poison drunk by Socrates came from neither, but from an herb of the *Cicuta* genus. Ground hemlock or Canada yew is an important deer and moose food. But woodsmen have remarked its scarcity in recent years, especially in western Nova Scotia. Possible causes for its decline are lumbering disturbances, overbrowsing by deer, and climatic change.

Early leather-makers leached hemlock bark for tannin, a dye and preservative. They left large volumes of sound, debarked logs to rot in the woods. Cloth can be dyed a dull red in an extract made from the middle bark. Indians poulticed sores and wounds with boiled and pounded inner bark. Settlers drank hemlock tea to induce sweating, and made brooms from the branchlets.

Hemlock looper damages foliage in certain areas of the province. Deer and rabbits browse hemlock when other food is scarce. Porcupines gnaw the bark.

A LARGE CONIFER WITH SMALL, GLOSSY, STALKED NEEDLES, DROOPING DARK GREEN FOLIAGE IN FLAT SPRAYS, A LEANING TIP, AND A TAPERED BRANCHY TRUNK THAT DEVELOPS A DEEPLY FURROWED REDDISH-BROWN BARK.

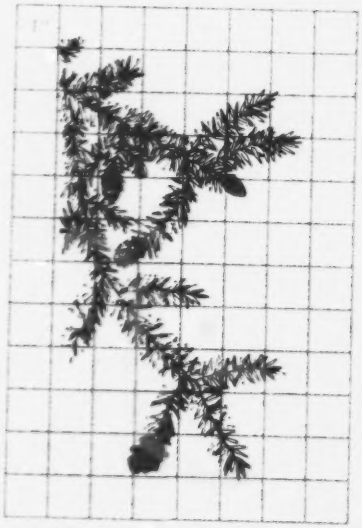
Needles Dark, shiny green and flattened, with two white lines below; $^1/_3$" to $^2/_3$" long, blunt-tipped and 2-ranked like balsam fir, but borne on short slender stalks that come off with the needles, a feature not shared by any other eastern conifer.

Twig Slender, hairy and brownish, with tiny blunt buds.

Cones Similar to those of tamarack, but longer and not erect; pale green with slightly toothed scale margins, each fertile scale bearing two winged seeds; cone turning red-brown at maturity; opening when dry, closing when wet; falling during early winter.

Bark Reddish or greyish brown, changing with age from scaly or flaky to rough and deeply furrowed; inner bark with purplish to cinnamon streaks. Rich in tannin (11%).

Wood Buff with a reddish tinge; tough and splintery, fairly hard; the annual rings distinct; inclined to be cross-grained and to twist in seasoning. Said to be rat-proof. Air-dry weight about 29 lbs./ cu. ft.



Balsam fir grows inside the Alberta-Newfoundland-New York triangle, ranging north nearly to Ungava Bay in protected valleys and south to the mountains of Virginia. Thriving best in a damp climate, it is common throughout the Maritimes and especially on the Cape Breton uplands, where thousands of acres of almost pure stands may be seen. It grows to around 60 feet tall and one to two feet in diameter, and matures in 60 to 70 years (maximum around 150).

Fir is one of our most valuable softwoods, being excelled for pulpwood here only by spruce. Besides its other uses in lumber, boxes and crates, fir is the favorite Christmas tree, and many Nova Scotia landowners now cultivate it profitably for that purpose. Cultivation includes weeding and thinning natural stands, and shaping individual trees.

The clear, oily resin ("Canada balsam") is collected elsewhere to make glass cement for microscope slides, because it bends light to the same degree as glass. Its medicinal value has long been recognized. Pioneers used it to heal sore throats, and woodsmen still apply it sometimes as a stop-gap dressing for cuts. A durable transparent varnish for paintings can even be made from it. But it is too bitter for chewing gum.

Fir grows best on moist well-drained loams, but adapts itself to cold swamps and rocky exposed headlands, where it usually becomes stunted. At high elevations it may not even look like fir, with its gnarled trunk twisting along the ground for protection and its boughs flattened by gales and storms.

This species can survive several decades of shading by other trees and still respond quickly when the shade is removed. It is found either in pure stands, or mixed with white pine, the spruces, tamarack, hemlock, birch, aspen and maple. Its vigorous, deep-rooted seedlings tend to replace those of the more valuable spruce after cutting. The fir is short-lived, however. Various roots usually set in after 40 or 50 years, especially on drier sites.

The chief insect enemies here are two. The balsam woolly aphid, a tiny sucking insect which may blanket the bark with its white masses, can deform or kill whole stands in a few years. The so-called spruce budworm is a small needle-eating caterpillar which in fact prefers fir. Defoliation for five years or more in a row kills the trees.

Deer and moose browse the foliage heavily. Porcupine girdle many trees. The seeds are eaten by several bird species, including ruffed grouse.

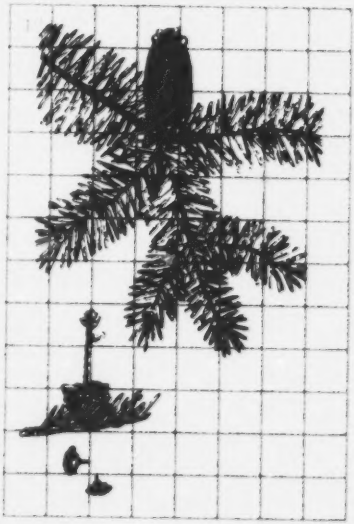
A DENSE STEEPLE-SHAPED CONIFER OF SMALL TO MEDIUM STATURE, WITH PROMINENT RESIN BLISTERS ON SMOOTH GREY-BROWN BARK; FLAT UNSTALKED NEEDLES, AND UPRIGHT DARK PURPLE CONES.

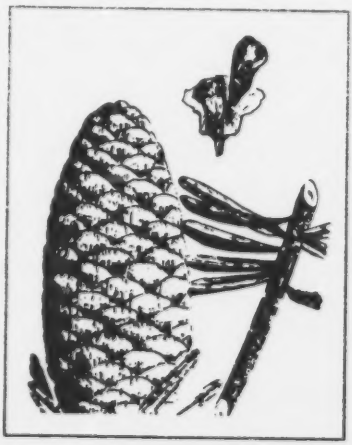
Needles Ranged mostly along opposite sides of twig like oars on a racing shell (spruce has bottle-brush arrangement) $^3/_4$" to $1^1/_2$" long, dark shiny green above, two white lines below, blunt-tipped or notched (spruces more or less sharp); fragrant when crushed or dried.

Cones Upright, dark green to purple, often with whitish resin droplets; ripening about October and falling apart, leaving erect, naked center spikes ("candles"). (Spruce cones hang down, and fall whole after maturity.) Seed purplish, two per cone scale.

Bark On young stems a smooth dull green, later with greyish patches and numerous raised resin blisters to $1^1/_2$" wide. Mature stems red-brown, slightly scaly, breaking into small plates on old trees.

Wood Creamy white, soft, light; weaker, less durable in dampness than spruce or pine; can be separated from the similar spruce by absence of tiny white dots (resin tubes) in dark part of annual ring. Air-dry weight about 24 lbs./ cu. ft. (density about 20% lower than for black spruce).





Except as an ornamental, cedar is too rare to be important in Nova Scotia. Its natural range is around the Greak Lakes and east through New Brunswick and New England, with pockets as far south as North Carolina. The decay-resistant wood is much used for fence posts and shingles. Cedar is also favored in canoe construction, where strength, lightness and freedom from warping and decay are essential. Its rubbery toughness is remarkable — a folded cedar shaving can be struck repeatedly with a hammer without breaking.

The local range of this scarce tree is virtually confined to the western end of Nova Scotia, such as in back regions of Digby and Yarmouth Counties, where it is found scattered around swamps, lakes and springs. On the Chignecto isthmus there is a slight "spill-over" from New Brunswick, the only Atlantic province where the species is common. Cedar has been widely planted as an ornamental, and apparently has escaped in some places to form local stands. This has happened in parts of Annapolis Valley.

"Arbor-vitae" is Latin for l'arbre de vie (tree of life.) This name is said to have been given the tree by the king of France about 1535, when explorer Jacques Cartier brought specimens to him from the New World. Thus cedar may have been the first North American tree introduced into Europe. Cartier's men are said to have been cured of scurvy by medicine which the Indians made for them by steeping the twigs. The Indians also shredded the dry outer bark for tinder to make fire.

Deer browse the branches heavily in winter. Rabbits eat the foliage and gnaw the bark of young trees.

It should be noted that North America's two *Thuja* species are not true cedars. The true cedars of antiquity, such as the Biblical "cedars of Lebanon," belong in the genus *Cedrus*, which has evergreen leaves of larch-like form.

A SMALL CONICAL TREE WITH SCALE-LIKE, OVERLAPPING LEAVES THAT PRODUCE A DENSE DARK YELLOW-GREEN FOLIAGE WHICH OFTEN LOOKS CLIPPED OR PRUNED; ALSO SHREDDY BROWN BARK, AND A MUCH-TAPERED TRUNK.

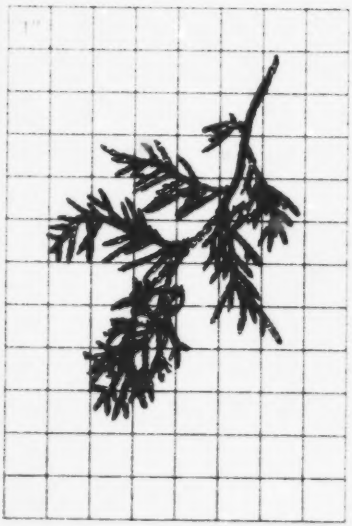
Needles Very small (about $^1/_8$" long), pointed, flattened, overlapping in opposite pairs and tightly covering the twig like shingles; dull yellow-green.

Cones Erect, oblong, composed of 4 to 6 pairs of thin brown scales; maturing in late summer, opening and remaining on tree over winter. Seeds small (325,000/ lb.), 2 and sometimes 3 per scale, with narrow wing along each side.

Twigs Slender, flattened, bearing flat, fan-shaped sprays; buds minute, scaleless, covered by needles.

Bark Thin, fibrous, reddish to greyish brown; the inner bark tough enough to make into string or rope.

Wood The lightest and most decay-resistant of eastern woods, yet tough under impact; pale brown to nearly white with a pleasant fragrance, soft (a sharp blade cuts it much like cheese), brittle; low shrinkage. Air-dry weight 21 lbs./ cu. ft.



THE HARDWOODS

INTRODUCTION

We have 14 native hardwoods of greater or lesser commercial importance. In order of volumes present* the principal ones are: red maple, sugar maple, yellow birch, white birch, aspen, beech, red oak, white ash, grey birch, American elm, black ash, ironwood.

Other native non-commercial hardwoods that reach tree size are: red ash, speckled alder, witchhazel, mountain-ash, mountain maple, striped maple, sumac, pin cherry, black cherry, choke cherry, serviceberry, willow, hawthorn.

The introduced hardwoods most commonly seen are: linden, Norway maple, sycamore maple, Manitoba maple, silver maple, Scotch elm, English elm, Chinese elm, apple, horse-chestnut, black locust, European ash, European birch, Carolina poplar, Lombardy poplar, silver poplar, English oak, willow, plum, cherry. These exotics will be described briefly with their native relatives.

Our list thus includes nearly 50 different broadleafed trees. How many of them can you recognize? A few notes may help to introduce the more important groups.

Birches are handsome trees, known chiefly by their papery bark. White and grey birch often come up in pure stands after fire. Yellow birch is our most important hardwood.

Maples are well known trees of forest and town. All have lobed opposite leaves that take on striking colors every fall, a feature that accounts for their popularity as ornamentals. From this group comes Canada's national emblem. Sugar maple is famed for syrup and fine wood. Children like to place the paired seeds on their noses for "pretend" spectacles or moustaches.

Aspens prefer moist, sunlit ground in forest clearings and on new burns. They are noted for drooping catkins, prolific sprouting, and leaves that tremble almost constantly. Poplars are close cousins, but have sticky buds and heavier seed capsules.

Willows and aspens are closely related, as their catkins reveal. Most willows have narrow leaves, and many have colorful twigs. They thrive near water. Only a few reach tree size.

Oaks, like maples, have lobed leaves. Northern red oak is our only native oak. The bristles on its leaf quickly set it apart from other oaks. A forest tree, it is not plentiful in this province.

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*As of 1975-82 Provincial Forest Inventory

Of all **Elms** the single native species is American elm. This big, umbrella-shaped tree with lop-sided, sandpapery leaves is seen mostly along rivers. In the early 1900's American elm was also widely planted in Maritime towns as a shade tree. Imported relatives are the Scotch and English elms.

Beech, as sweethearts know, has the best bark in which to carve initials — though the practice is bad for the tree. Its spine-covered, three-cornered nuts are also well known. The native species grows in hilly parts of the province. Imported beech are seen here and there in the towns.

Ash is the only large native tree with compound leaflets. If found in a swamp it will likely be black ash; elsewhere in the forest it is safe to call it white ash. Red ash is rare here.

Trembling aspen, though common across the province and found throughout the northern half of North America and in the western mountains, is not an important timber tree locally. Floors made from it are said to wear to a beautiful, splinter-free white, but sugar maple is more durable. At present its chief uses are in match veneer and firewood. Other uses are chemical pulp, excelsior, boxes, toys and baskets.

One important function often overlooked is its value as a "nurse crop" for more valuable species. After fire or cutting, this short-lived poplar is often among the first trees to appear, arriving by windblown seeds or by root suckers and stump sprouts. Under its gentle shade slash decays rapidly, and the seedlings of softwoods and other shade-tolerant trees soon develop there. In 20 to 30 years these seedlings usually outgrow the aspen. They crowd it out, leaving only scattered survivors, which may live to 80 or 90 years. Aspen leaffall helps to lower soil acidity.

The long hairs on the seeds buoy them up and enable them to travel for miles on air currents. Water also spreads the seeds.

Root suckers arise from root buds four or five inches below the surface. The root buds are stimulated by the increased sunlight and heat reaching the ground after fire or cutting.

Trembling aspen sometimes reaches a height of 70 to 80 feet and a diameter of one to two feet. More often it is 40 to 50 feet tall and less than a foot in diameter. Though forming extensive pure stands, it also mixes with other pioneer species such as large-tooth aspen, white birch and pin cherry.

Aspen provides important wildlife forage. Moose and deer feed on the leaves and twigs, ruffed grouse eat its winter buds, rabbits and mice like the bark and twigs, and beavers make the bark their staple diet. To us this inner bark is exceedingly bitter; pioneers extracted a quinine substitute from it.

Most Indian words for this tree mean "noisy-leaf". The trembling habit of the similar Old World aspen led the ancient Greeks to compare its leaves to women's tongues: never still. Perhaps they were unaware that about two thirds of all aspen trees are male.

The major enemies of aspen in Nova Scotia are hypoxylon canker, which kills the bark, and the leaf-eating forest tent caterpillar.

A SMALL TO MEDIUM-SIZED SLENDER TREE WITH PALE GREENISH-BROWN BARK, FINE-TOOTHED ROUNDISH LEAVES THAT FLUTTER IN THE LEAST BREEZE, AND SHINY BROWN TWIGS WITH SHARP BUDS.

Leaves Simple, alternate, lustrous dark green above, dull yellow-green below; borne on a vertically flattened stem about as long as the leaf is wide.

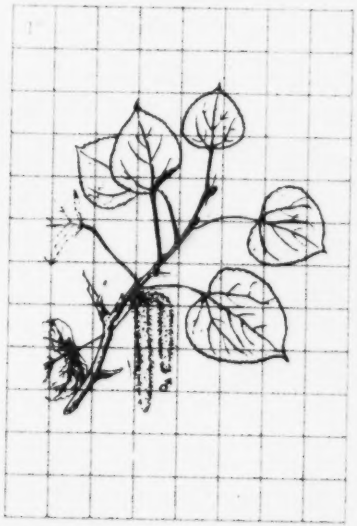
Twigs Slender, shiny, reddish-brown with a star-shaped pith; buds shiny dark brown, mostly sharp-pointed and incurved toward twig.

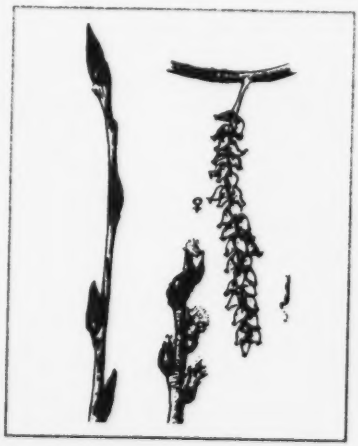
Seeds Minute, released from $^1/_4$" greenish capsules to float downwind on silky "parachutes".

Flowers Opening before the leaves from special large buds in drooping hairy spikes or catkins (ie: "little cats"); composed of hundreds of tiny blooms without petals; male and female catkins on different trees.

Bark Smooth and pale on young trees, becoming furrowed and dark brown or grey.

Wood Soft, light, not strong; white to grey-brown; not durable when left exposed; takes and holds nails well, and can be nicely finished; inclined to warp unless piled correctly while drying; milled stock tends to have fuzzy edges, and the wood has a faintly rancid odor when wet. Air-dry weight about 28 lbs./ cu. ft.





Largetooth aspen is a tree of eastern North America, and is found across Nova Scotia on light soils or burnt-over sandy areas. It is especially plentiful in the Annapolis Valley. Because the seeding habits and light needs of trembling and largetooth aspen are similar, they often grow together. However, largetooth aspen seems to need a sandier soil than its counterpart. Sandy slopes and stream banks in particular are preferred. Other common associates are white birch, grey birch and pin cherry.

The wood is not much used commercially. Like that of trembling aspen it is made into core veneer, matches, boxes, and sometimes firewood. In other parts it is also used in chemical pulp. As wildlife forage it serves the same needs as trembling aspen. Sometimes the logs of both are stained with a preservative and used in log cabin construction. Their softness makes for easy notching and fitting with only axe and saw. For the same reason both aspens are commonly used for rustic camp and cottage furniture.

Largetooth aspen is fast-growing and short-lived, commonly sprouting from the stump. The seeds are wafted long distances by wind, and carried by water. Like those of trembling aspen they germinate within a day or two after alighting on moist ground. Bare soil is preferred. Few seedlings survive to maturity, however; the main form of reproduction is by root suckers. Like the willows, both aspens are said to root and grow well from fresh cuttings stuck into moist ground.

The forest tent caterpillar is sometimes a serious pest. Hypoxylon canker damages younger trees. The leaves are sometimes infected with a minor disease called ink spot.

A SMALL TO MEDIUM-SIZED TREE WITH COARSE-TOOTHED, TREMBLING LEAVES, OLIVE-GREEN TO BROWNISH BARK, DOWNY TWIGS AND BUDS, AND CATKINS IN SPRING.

Leaves Dark green above, paler below, borne on vertically flattened stalks that result in almost constant fluttering (see trembling aspen); alternate, simple.

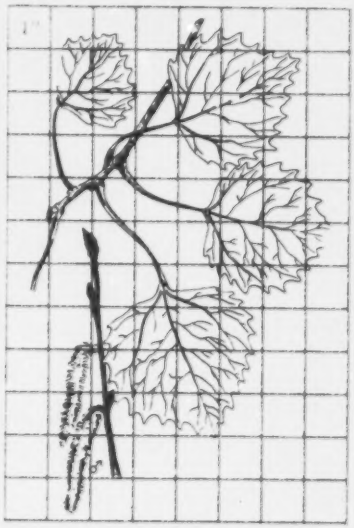
Twigs Stouter than trembling aspen, with larger buds; twigs and buds more or less grey-downy; pith star-shaped.

Flowers Male and female on separate trees in drooping, hairy catkins; appearing before the leaves.

Seeds Minute, silken-haired, contained in $^1/_8$" to $^1/_4$", pale, downy green capsules arranged on loose catkins and developing with the leaves; the capsules splitting when ripe.

Bark Smooth and olive-green at first, becoming brownish and furrowed (almost black at base of old trees).

Wood Whitish to pale brown, soft, lightweight, not strong; prone to decay unless kept dry; recognizable as aspen by fuzzy edges in milled stock, but usually inseparable from trembling aspen. Air-dry weight about 28 lbs./ cu. ft.



This native poplar is scarce in Nova Scotia. It is rarely seen as a native forest tree outside of northern Cape Breton, and there it is not plentiful. However, balsam poplar does occur in pockets right across Canada, in the northwestern mountains of the United States, and in Alaska. It will grow on all but the wettest and driest sites, but the most favored habitat is rich bottomlands. Here it forms small pure stands, or mixes with willow, alder, white birch, fir and spruce. Like the aspens it shuns shade.

Many settlers planted the balsam poplar about their homes, where its descendants can often be found today. The tree matures in about 100 years, but may live for 200. From its resinous buds and those of a very similar species (see note below) is extracted a compound that effectively stops bleeding from minor cuts, and which, when used in an inhalator, clears cold-clogged nasal passages. This is sold under various trade names, notably "Friar's Balsam".

This poplar has no commercial value in Nova Scotia. As an ornamental it is not highly valued either, because its catkins litter the ground in late spring, and its gummy buds attract wasps. On the prairies, however, planted rows of it serve as valuable windbreaks. The wood is used for veneer, lumber, excelsior, fuelwood and pulp. Sometimes the tree is set out as a nurse crop in white spruce plantations.

Fire quickly kills the young trees. The forest tent caterpillar will eat the leaves if aspen leaves are scarce.

Note: Balsam poplar can be confused with a similar poplar called Balm-of-Gilead (**P. candicans** Ait.) which is occasionally found in western counties. The only difference between them is that the leaves of the latter are hairy, especially on the veins beneath. According to Roland and Smith, Balm-of-Gilead may be a cross between balsam poplar and some European species.

A MEDIUM-SIZED TREE BEARING SOMEWHAT HEART-SHAPED LEAVES WITH RUSTY BLOTCHES UNDERNEATH, STOUT TWIGS WITH LARGE, STICKY, AROMATIC BUDS; AND LONG FLUFFY CATKINS IN SPRING.

Leaves Dark glossy green above with rusty blotches below, hairless, base rounded, stalk not flattened; alternate, simple.

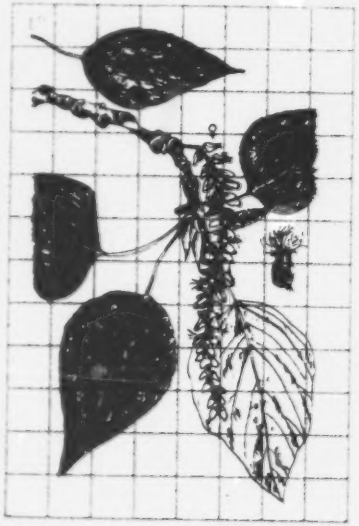
Twigs Stout, shiny red-brown twigs with large aromatic buds that exude an aromatic resin ("balm"); pith star-shaped.

Flowers Long drooping fluffy catkins, male and female on different trees; appearing before the leaves.

Seeds Minute, tufted, contained in 1/4" brown capsules on long, loose catkins; early summer.

Bark Smooth greenish to brownish at first, becoming dark grey and deeply furrowed.

Wood Very similar to that of the aspens, except with a greyish tinge. Air-dry weight about 29 lbs./ cu. ft.



INTRODUCED POPLARS

Three introduced poplars are commonly seen planted about homes and streets: Carolina poplar (P. X *canadensis* Moench), Lombardy poplar (*P. nigra* L. var. *italica* Muenchh.), and white poplar (*P. alba* L.). Each is easy to tell from the others in summer and in winter (Fig. 1, and accompanying text).

The first two are *hybrids* — i.e.; cross-bred types not able to reproduce by seed, and therefore each descended, by means of cuttings, from a single original parent. Both the hybrids have flattened leaf-stalks like our aspens. Unlike them, they have a translucent leaf edge.

CAROLINA POPLAR A tall tree with upswept branches, bright-green, glossy, triangular leaves that flutter audibly in the least breeze, curved yellowish twigs, and drooping catkins (male only). Fast-growing, handsome, resistant to smoke and dust; but not recommended for street planting because the roots seek out and crack water and sewer mains. If Carolina poplar is to be destroyed on this account, the bark should be girdled in spring and the tree not removed until fall, to prevent suckering. Also called hybrid poplar locally. One of its original parents was probably Lombardy poplar.

LOMBARDY POPLAR A medium-sized to tall tree easily known by its narrow, spire-like crown of small, sharply upcurved branches, dark green triangular leaves that flutter as above; slender, curved, yellowish twigs; and dark grey, furrowed bark. Very decorative; but in our climate it is short-lived and subject to damage from sleet, insects and disease.

WHITE POPLAR A small, branchy tree with wavy-edged leaves that are dark green above and felty white beneath (making the tree appear suddenly silvery when a gust of wind turns the leaves); downy-white twigs and buds, and dark grey, furrowed bark. The common variety *nivea* has a maple-like, lobed leaf, and is often mistakenly called "silver maple". (The true silver maple has the leaves silvery-smooth beneath). Once established, this tree is very hard to get rid of, due to its abundant and vigorous root suckers.

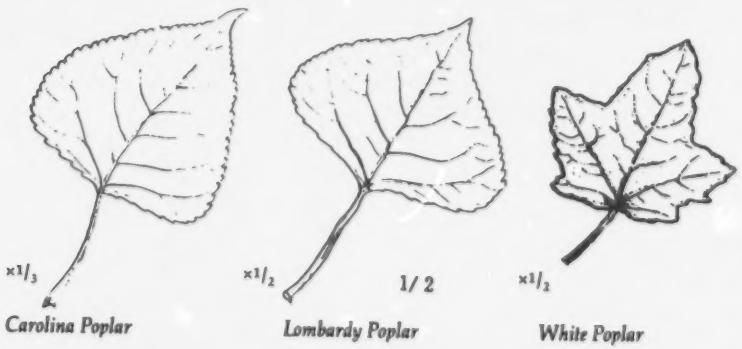


Fig. 1 Three Introduced Poplars

WILLOW *Salix* spp.

There are over a dozen native and introduced willows which sometimes reach tree size. All are variable in their features, and many interbreed. In general they have narrow leaves and colorful, flexible twigs with numerous alternate, one-scaled buds that press close against the twig (Fig. 2). For detailed information consult one or more of the publications on Nova Scotia plants listed in the last section.

The only two that reach the stature of large trees are the introduced French or golden willow (*Salix alba* var. *vitellina* (L.) Stokes) and crack or brittle willow (*S. fragilis* L.). French willow is the more common. The introduced weeping willow (*S. babylonica* L.) is smaller and distinguished by its lovely crown of narrow leaves borne on slender drooping branchlets.

Both have glossy, narrowly lance-shaped leaves that taper to the base. Those of French willow usually have the midrib slightly hairy beneath. In crack willow the midrib is hairless. The best distinction, however, is that crack willow branchlets break away very easily and cleanly at the base when bent sharply downward (hence the name), but those of French willow do not.

Both willows were introduced from Europe, where with other *Salix* species they are important for basketry. Willow wood, being strong and durable yet light, is also used in artificial limbs.

Fig.2 Typical Willow Features

Yellow birch is our most valuable hardwood and the largest of our native birches. It comprises nearly one-quarter of our total hardwood stock, thus making up in quantity what little it lacks in quality when compared to sugar maple, which comprises about 15 per cent of the total. It is found everywhere in the province, especially in the upland hardwood mixtures which cover the Musquodoboit, Pictou and Cape Breton hills and the Cobequid Mountains.

On these uplands its most common associates are sugar maple, red maple, beech, red spruce, hemlock and balsam fir. Yellow birch prefers cool northern slopes, but in the central counties it also occurs on swampy land. Around the coast it is scarce.

This birch ranges from Newfoundland west to Minnesota, and south through the Appalachians to the northeast corner of Georgia. It may grow to about 70 feet tall and two feet in diameter.

Reporting in 1773-74 on our stocks of yellow birch, Charles Morris, Surveyor-General of Nova Scotia, wrote:

> *. . . the wood of this Tree is firm, close-grained, in color resembling the Mahogany but stronger and more substantial; it is used here in Shipbuilding and has been found to be more durable than Oak, especially for such parts . . . as lie under water, and for plank . . . the branches are large at the joining of the main stock, making excellent knees.*
> **(Lumbering in Nova Scotia: 1632-1953,** *C. B. Fergusson; Dept. of Lands & Forests, Truro, N.S.: 1967.)*

Today wooden ships are less important. But we still use yellow birch for flooring, furniture, doors, veneers and plywood, and for cabinet work. Cape Breton's Indians make baskets from the wood, and D. A. Burke, Cape Breton, reports the sailors used to shred the base of a birch stick for a deck-broom. A handful of the oily bark shreds will start a fire even on a rainy day, and oil of wintergreen (used to flavor medicine), can be distilled from the bark. The presence of this oil makes the tree easily damaged by fire. Yellow birch is a favourite browse of deer. Many birds eat the seed, which often fall on the snow. Grouse eat the buds and catkins.

Yellow birch is often found growing "on stilts", with open space between the roots and ground. This happens when a seed sprouts and takes root on a rotting stump or log that later crumbles away. Cracks in boulders are another favorite place. Bare mineral soil is best of all. It lives to about 300 years.

The chief natural enemies are birch dieback, bronze birch borer, and white-marked tussock moth.

A MEDIUM-SIZED TREE WITH YELLOWISH CURLY BARK (ALMOST BLACK IN OLD AGE), OBLONG SHARP-POINTED LEAVES, AND A WINTER-GREEN TASTE TO ITS TWIGS.

Leaves Dark glossy green above, yellow-green below and usually hairless; alternate, simple.

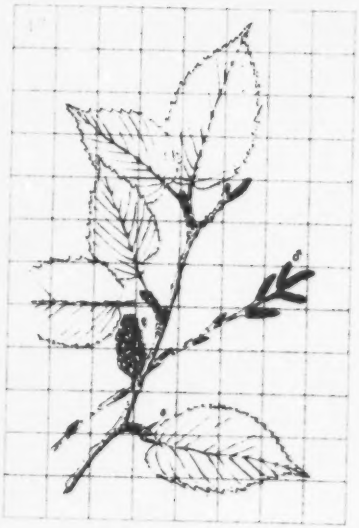
Twigs Slender, brownish, smooth or hairy, more or less zig-zag, with a strong wintergreen taste; buds about 1/4" long, chestnut-brown, fuzzy.

Flowers Greenish, male in clustered catkins that elongate in spring from catkins formed the fall before; female much smaller, solitary; appearing from special buds with the leaves; both on same twig.

Seeds Tiny, 2-winged nut borne by hundreds in an egg-shaped 1" to 1 1/2", upright cone; ripening in autumn, shed during fall and winter; cone sometimes present all winter.

Bark On young trees thin, smooth, yellowish brown; soon developing thin papery curls; on very old trunks thick, platy and reddish brown to nearly black.

Wood Highly prized for its strength, hardness, handsome figure and fine finishing qualities, in all of which it excels white birch; pale yellow to reddish brown; air-dry weight about 44 lbs./ cu. ft.



Because of its delicate form and familiar white bark, white birch has been called the "Lady of the Forest". It is common across Nova Scotia, especially near the Bay of Fundy and eastward. Its several varieties range from Newfoundland to Alaska, and from the tree limit to New England and the Lake States. Mostly it is found scattered among softwood growth. But sometimes large pure stands are formed, especially where fire has bared the mineral soil on moist sites. Because its bark is thin and very flammable, fire is also one of its worst enemies.

Typical associates are aspens, willows and pin cherry, which also prefer mineral soil and open sunlight. Like them it is fast-growing and short-lived (60 to 75 years). Eventually all but the tallest die from the shade of the longer-lived, shade-tolerant softwoods which in time overtop them. These scattered lone trees are especially noticeable on pulpwood cutovers, where the removal of softwoods and the sudden influx of sunlight and heat usually kill them.

White birch will sprout from the stump (called coppice growth) after fire or cutting, and in this way whole stands may regenerate in clumps. It grows up to 70 feet tall and 30 inches in diameter.

The main products from this species are veneers and plywood, spoolwood, clothes-pins, handles, dowels, toys and woodenware, railway ties and barrel hoops. Much is cut for firewood also. Among the Indians it was one of the most important trees. From it they fashioned the famed birch bark canoe (whose design Europeans later copied in cedar and canvas), rain-tight wigwams, cookpots, cups and plates. Settlers put sheets of it under their shingles, and woodsmen have used it for centuries to kindle campfires.

A word of wisdom about birches; don't peel the bark off live trees. Removing more than the top few layers causes the inner bark to turn black and unsightly.

In the early 1900's a mysterious disease called birch dieback began to destroy vast areas of birch, both white and yellow, in eastern North America. No explanation was found. Around 1940 it reached Nova Scotia. However, since about 1950 the trouble seems to have subsided and many trees have recovered. Other enemies include the bronze birch borer and the birch leaf skeletonizer. The Indians say that lightning never strikes a birch.

A MEDIUM-SIZED TREE WITH CHALKY WHITE, EASILY PEELED, PAPERY BARK, MORE OR LESS HEART-SHAPED LEAVES, AND CATKINS.

Leaves Smooth dark green above, paler and slightly hairy below; alternate, simple; the base varying from heart-shaped to rounded in different varieties.

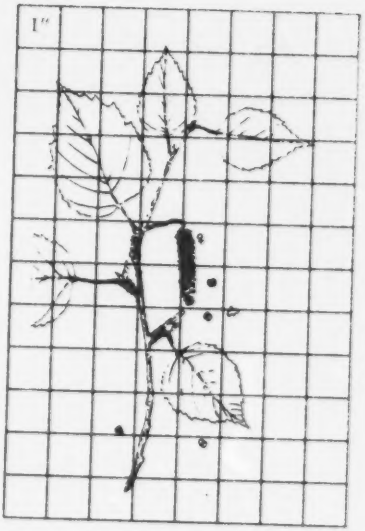
Twigs Slightly zig-zag, hairy on new shoots, later becoming smooth, shiny and red-brown except for numerous whitish speckles; buds brown, about 1/4" long, faintly downy, sometimes mildly resinous.

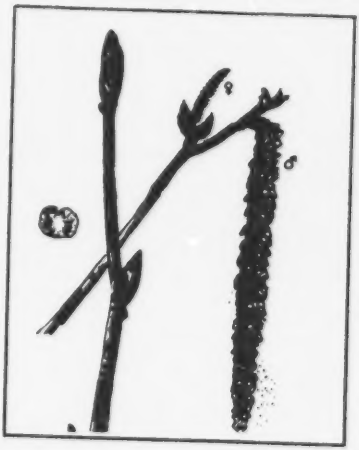
Flowers Male in long drooping catkins that develop from 1" to 2" catkins formed the fall before and visible all winter; the female much smaller, and appearing with the leaves; both on same twig, both elongating in April-May.

Seeds Tiny, 2-winged nut borne by hundreds on a drooping catkin-like cone, ripening in autumn, shed during fall and winter.

Bark Dark brown and thin at first, becoming many-layered, chalky to creamy white (sometimes with pinkish tinge); certain native varieties also brownish; upper (younger) parts of branches always brownish.

Wood Creamy white to pale brown, not as hard as that of sugar maple or yellow birch, but harder than that of red maple and aspen; moderately strong, grain is faint; works easily and takes a nice finish; air-dry weight 40 lbs./ cu. ft.





GREY BIRCH *Betula populifolia* Marsh.

Other common names: Wire Birch, White Birch

This small tree is often mistaken for young white birch, but the two species differ in several ways (Fig. 3). In grey birch the dull chalky-white bark is tight and hard to peel, whereas the bark of white birch tends to be flaky even on young trees. Also, the black triangles marking where limbs join the main stem are more pronounced in grey birch. Moreover, its leaves are on the average smaller, and much more drawn out at the tip. In winter its slender wiry twigs are distinguished by their drooping habit, rough warty appearance, and slightly sticky buds.

Grey birch occurs from southern Ontario to the Maritimes and south to Delaware. Because of its small stature and its habit of quickly invading abandoned pastures, burns, and barrens, it is regarded by many as a weed tree. In this province it is most common in the western counties, being more or less replaced by white birch eastward.

Sometimes it serves as a useful nurse crop for young pine, but unless the grey birch saplings are cut early they will later crowd out the pine. Fuelwood, barrel hoops and spoolwood are its chief uses. Many birds eat the seeds.

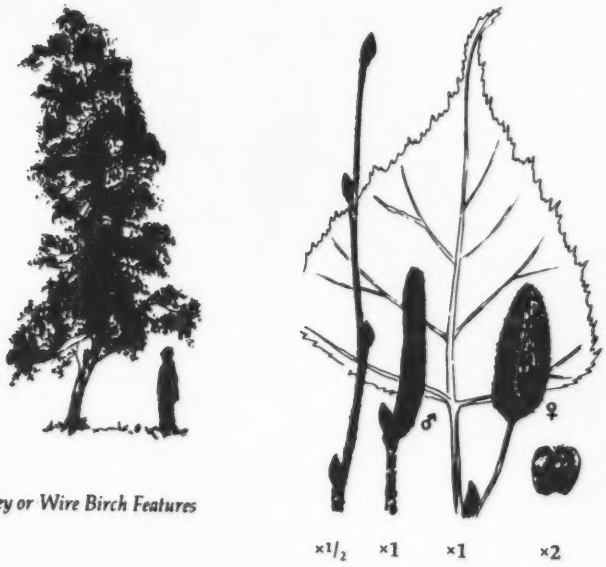


Fig.3 Grey or Wire Birch Features

INTRODUCED SPECIES

The only foreign birch commonly seen is the European or weeping birch (*B. pendula* Roth) and its cut-leaf variety. The bark and leaves resemble those of our grey birch, although the bark is more flaky, and the leaf is more rounded at the base, with a less long-pointed tip. The cut-leaf variety has a V-notched leaf.

Another European import, white birch (*B. alba* L. or *B. pubescens* Ehrh.), may occur, but it has not been definitely reported. It resembles the native white birth but has smaller leaves and quite resinous buds.

IRONWOOD *Ostrya virginiana* (Mill.) K. Koch

Other common names: Hornbeam, Hophornbeam

Nova Scotia's hardest and heaviest native wood comes from this small member of the birch family. It is a slender tree with leaves very like those of yellow birch (Fig. 4). The bark is light brown and scaly, and the twigs are tough and wiry without a wintergreen taste.

The seeds are greenish nutlets borne in clustered, bristly, bladder-like sacs on a slender stem. They develop from short greenish female catkins that appear in spring on the same twig with similar, pre-formed male catkins. A useful summer identification feature are the tiny stalked glands which usually appear on new twigs, on leaf stems, and on the undersides of the leaf veins.

In winter ironwood is best identified by its bark and twigs. The bark tends to shred off in narrow, scaly, curling strips. Often it shows a distinct spiralling pattern up and down the trunk. The twigs resemble those of grey birch in that they are a dark red-brown, very slender, and wiry; but they differ in that they are shiny and lack warty glands.

The tough, shock-resistant wood is whitish to pale brown and takes a good polish. It is very hard to nail. The air-dry weight is about 50 pounds a cubic foot.

Roland and Smith report that ironwood, although scattered from Annapolis County to Cape Breton, is rare except along intervales and on alluvial soils in the central part. Ralph Johnson adds that it is found on well-drained soils in North Queens. The tree occurs throughout eastern North America.

Because of its scarcity and small size, ironwood is not much used except for firewood, tool handles, sled-runners and the like. Grouse eat the winter buds.

Fig.4 Ironwood Features

SPECKLED ALDER *Alnus rugosa* (DuRoi) Spreng.

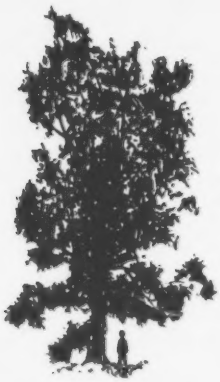
Other common names: Grey alder

Of the three native alders (not to be confused with the **elder** *(Sambucus* spp.*)*, which has a compound leaf), speckled alder is the only one which reaches tree size. When it does, it is usually leaning, crooked, and much-branched. Most people are familiar with its speckled grey bark and double-toothed, finely wrinkled leaves (bluish-white or green below, depending on the variety).

Other useful identification features are its stalked, two-scaled buds borne on twigs with a three-cornered pith; its drooping, yellowish male catkins (formed the autumn before); and its oval, brown-black seed-cones, which turn woody and often remain on the tree all winter (Fig. 5). Speckled alder occurs in dense thickets on low ground throughout the province.

Because alder roots bear nitrogen-rich nodules, drained alder flats can be quite fertile and suitable for raising leafy vegetables. It is said that the best way to clear an alder-bed is to fence it, let one or two pigs root about in it for a summer, and then remove the dead stems. Alder swamps in low-lying parts of softwood stands sometimes halt the progress of forest fires. Birds eat the small winged nutlets, which resemble birch seeds.

Fig. 5 Speckled Alder Features



American lumbermen have long been troubled about the slow but steady spread of a potent disease through their important stocks of beech. The disease is caused by the *Nectria* fungus aided by an insect called beech scale. Both seem to have entered North America via Nova Scotia, the fungus around 1929 and the insect about 1890. Colonies of scale insects damage trees by piercing the bark and sucking sap. Later, wind-borne fungus spores infest the damaged tissues, which develop spreading cankers that deform or kill the tree.

American beech ranges over all of eastern North America except Newfoundland, the lower Mississippi, and southern Florida. In Nova Scotia it is common in the hardwood areas, being found on moist, well-drained slopes with maples and yellow birch. It also grows with red spruce, hemlock and white pine. Though it tolerates heavy shade, pure beech stands sometimes clothe hilltops. Extreme cold damages this species, which in Cape Breton is at its northern limit.

Beech wood is used in woodenware, small furniture, and sometimes flooring. Mice, squirrels, bears, raccoons and ruffed grouse eagerly seek the nuts. American settlers stuffed mattresses with the leaves, which stay springy longer than straw.

Lovers have long used the bark for carved declarations of affection. Sometimes it has worn other messages as well. A famous old beech in Tennessee used to carry the following inscription:

D. BOONE CILLED A BAR ON TREE IN YEAR 1790

Beech bark was probably the first paper of our ancient European ancestors, and the words for "book" and "beech" are very similar in many North European languages (eg; Swedish "bok" can refer to either).

INTRODUCED SPECIES

European beech *(Fagus sylvatica* L.*)* is very similar to the native tree in bark, leaves and twigs, though the leaves and twigs are smaller, and the leaves less pointed. (The purple-leafed beech sometimes seen is a variety of this tree.) In Europe this beech is a large and important timber species. Its nuts are collected for hog-feed and cooking oils. Archaeologists have shown that the same species provided food for ancient cave dwellers in the region.

A SMALL TO MEDIUM-SIZED BRANCHY TREE (IN NOVA SCOTIA) WITH SMOOTH GREY BARK, LONG-POINTED, STRAIGHT-VEINED LEAVES, ZIG-ZAG TWIGS WITH LONG, SHARP, TAN BUDS; AND PAIRED EDIBLE NUTS IN A SPINY BUR.

Leaves Papery, dark blue-green above, paler below with straight side veins, each ending in a tooth; smooth on both faces, except for hair in the vein angles below; simple, alternate; often staying on the tree all winter.

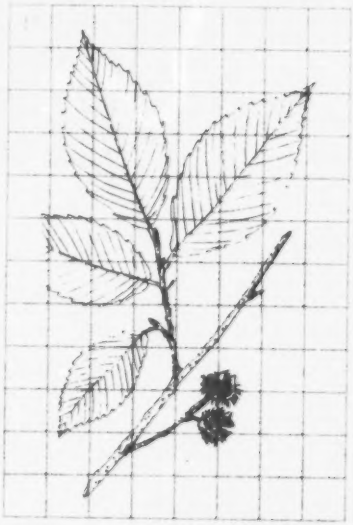
Twigs Slender, zig-zag, shiny brown; buds alternate, pointing away from twig, nearly 1" long, with shiny brown scales.

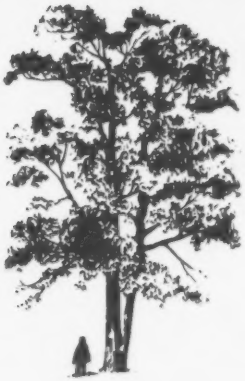
Flowers After the leaves; male in small yellow-green clusters; female in short spikes, both on same tree.

Seeds Shiny, brown, sweet three-cornered nut, borne in 2's or 3's inside a prickly husk that splits open four ways upon ripening around October.

Bark A smooth grey-blue, even in old age.

Wood Creamy to reddish brown, speckled in flat-sawn wood with fine dark vertical dashes; hard, heavy, strong (close to yellow birch and sugar maple in these respects); difficult to season, but taking a good polish. Air-dry weight about 46 lbs./ cu. ft.





Red oak is found throughout on light or well-drained soils. Johnson reports it as a common component of fire stands in western Nova Scotia, mixed with aspen, white birch, and grey birch. In some localities, such as at Pleasant Bay and near Cape North on Cape Breton Island, and in parts of Queens County, there are pure stands. In other areas it is absent. Roland and Smith say that apparently it was once much more common in the Annapolis Valley than now.

Outside the province this fast-growing, hardy oak ranges over most of eastern North America except Florida and the southern coastal lowlands. It ranges farther north than any other species in the red oak group.

Because it prefers plenty of light, red oak will often be found on sandy or rocky soils with light-loving species like aspen, white birch or red maple. On such soils it does not grow large. On better sites it is usually seen in company with sugar maple, yellow birch, white ash, red spruce and white and red pine. There it may reach 50 to 70 feet in height and two to three feet in diameter. It is fast-growing and lives 200 to 300 years. Young trees sprout vigorously when the stem is killed by fire or cutting.

Furniture, flooring and interior finish are its main uses in this province. Unlike white oak it cannot be used for leak-proof barrels, because its open pores will not hold liquid. (White oak pores are clogged by deposits.) This characteristic of red oak can be shown by blowing against the end surface of a short piece of the wood: the air passes right through.

As an ornamental for larger lots, this species has good features. In the open it develops a broad crown of stout branches, sometimes forking near the ground. In autumn the foliage turns a deep crimson. The acorns, though bitter to our taste, are eaten by squirrels and deer and probably by other animals and birds.

The chief enemy of both forest and ornamental trees is the winter moth. Introduced to the Maritimes from Europe sometime before 1930, its caterpillars strip foliage severely in some areas. The forest tent caterpillar also attacks red oak.

INTRODUCED SPECIES

English oak *(Quercus robur* L.*)* is sometimes seen along our roads and streets, especially in the Annapolis-Halifax-Truro region. Its small round-lobed leaves and small oblong acorns are quite different from those of the native red oak, and its winter buds are hairless.

A FAIRLY LARGE STURDY TREE BEARING DARK GREEN LEAVES WITH 7 TO 11 BRISTLE-TIPPED LOBES, STOUT ACORNS, AND TWIGS WITH A STAR-SHAPED CORE AND A CLUSTER OF BUDS AT THE TIP.

Leaves Dull dark green above, yellow-green below with tiny tufts of hair in angles of veins, the 7-11 lobes each tipped by a stiff bristle; often staying on tree during winter; simple, alternate.

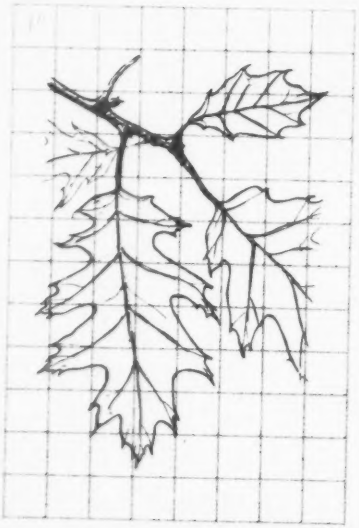
Twigs Fairly stout, dark red to greenish brown, with alternate sharp-pointed usually fuzzy buds, larger tip buds, usually clustered; pith star-shaped in cross-section.

Flowers Greenish, both sexes on the same tree; appearing before or with the leaves, the male a loose catkin, the female a cluster of tiny spikes.

Seeds Brown acorns of varying shapes mounted in many-scaled, cup-shaped to saucer-shaped base; needing two years to mature (small and flat the first year); bitter.

Bark At first a smooth greenish brown, later dark brown to nearly black and broken into many wide, flat-topped ridges; finally developing narrow, corrugated ridges; inner bark orange or yellow.

Wood Pale reddish-brown with rings or relatively large open pores marking the growth rings on the end-face; hard, heavy, strong (but less so than white oak); air-dry weight about 43 lbs./ cu. ft.



Because of its distinctive form and broad geographic range (all of eastern North America), white elm is one of the best-known of all native trees. In Nova Scotia it occurs as a scattered tree along river flats, particularly through the central and northern counties, and in sheltered pockets on Cape Breton Island. In the open it forks near the ground and soon develops the familiar vase or umbrella shape. It is not confined to bottomlands, however, and in the forest it produces a tall, straight trunk with a small crown.

Due to its relative scarcity, white elm is little used except as an ornamental. Among ornamentals it has long been a Canadian favorite. Unfortunately, Dutch elm disease is spreading in the Maritimes. This disease entered the United States about 1930 on imported European elm veneer logs. The fungus appeared in central Canada in 1944. Because it kills several species of elm, a quarantine has been placed on all imports of European elms.

Efforts have also been made by federal forestry personnel to keep the disease (which is carried by the otherwise fairly harmless elm bark beetle) from crossing the border into Nova Scotia. But in the summer of 1969 the disease was discovered on two trees in Liverpool, Queens County. The next year it appeared in the Kentville area. It has since spread to most areas of the province.

The symptoms of Dutch elm disease include sudden wilting and yellowing of parts of the crown followed by death of the affected branches. Because several other elm diseases cause similar symptoms, in doubtful cases one should send samples of diseased branches to the nearest forestry office to make sure.

No effective control is known. Early treatments concentrated on killing the beetles early in the spring with a high-reaching insecticide spray. This worked temporarily, but it also resulted in killing or harming birds which nested and fed in the contaminated area. Breeding of resistant elm-varieties holds promise.

The best general treatment is to keep trees healthy by proper care, and to remove and destroy all dead and dying material in which elm bark beetles might breed.

Growing as they do on the flood-plains of streams, elms are often flooded in spring. The seedlings can withstand this while dormant, but will die if the water remains until the growing season. American elm can stand only moderate shade. It will reproduce vigorously from stump sprouts and root suckers. The winged seeds are carried up to a quarter-mile by wind, and farther by water. Mice and birds eat many seeds.

American Indians made utensils and rope from the fibrous bark, and the early settlers soaked slabs of it in water and pulled off long flat strips for weaving chair seats.

A MEDIUM-SIZED TO LARGE, SPREADING (OFTEN VASE-SHAPED) BOTTOMLAND TREE WITH VARIABLE, LOP-SIDED LEAVES, ZIG-ZAG TWIGS, AND OVAL-WINGED SEEDS.

Leaves Dark green and either smooth or sandpapery above, paler and usually hairy below, lop-sided at the base; often appearing 2-ranked on twig; alternate, simple.

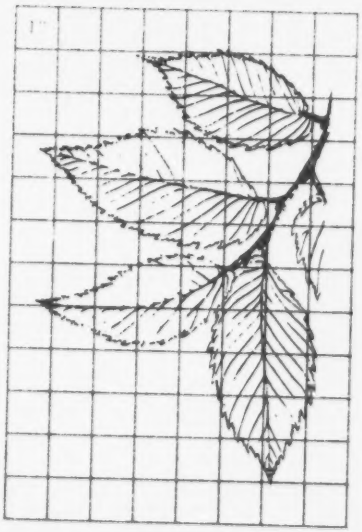
Twigs Slender, red-brown, zig-zag; leaf-buds pointed, slightly hairy, about $^1/_8$" long (flower buds rounded, larger); branches becoming rough and corky with age.

Flowers Before the leaves, male and female combined in long-stemmed, loose clusters.

Seeds Small one-seeded samara with papery wing fringed with fine hair, notched in the form of a young bird's open beak; samara falling early summer.

Bark Grey, soon furrowed into fibrous, interlacing ridges; inner bark streaked with buff corky patches; drooping branchlets present along trunks of younger trees.

Wood Pale brownish, often with a fine wavy grain; hard, heavy, extremely tough and hard to split; bends and works well under tools, and takes a good finish. Air-dry weight about 42 lbs./ cu. ft.



INTRODUCED ELMS Three foreign elms are commonly seen: Scotch elm (*Ulmus glabra* Huds.) English elm (*U. procera* Salisb.), and Siberian or "Chinese" elm (*U. pumila* L.). They can be separated by these differences:

SCOTCH ELM Also called Wych elm, this species has wide, dark brown leaf buds and conspicuous rounded flower buds; coarse-toothed, sandpapery leaves that often look almost 3-lobed near the tip; nearly circular hairless seed-wings (about 1" across), and yellowish branches that stay smooth for many years.

ENGLISH ELM This large elm has a straight trunk with nearly horizontal branches, sandpapery lopsided leaves, small (about $^1/_2$"), somewhat heartshaped, hairless samaras; moderately stout grey twigs with a warty, slightly fuzzy surface, and pairs of wedge-shaped scars near the buds.

SIBERIAN ELM A small spreading tree with small narrow leaves of a smooth, leathery texture, arranged in two distinct rows; hairy, zig-zag twigs, and small ($^3/_8$") samaras. Because of its resistance to Dutch elm disease, this Asian elm is becoming more popular as an ornamental than the European kinds. It may not be hardy enough for our climate, however. The foliage turns red to purple in autumn.

WITCHHAZEL *Hamamelis virginiana* L.

Other common names: Winter-bloom, Snapping-hazel

This strange-looking little tree or large shrub has even stranger habits: it blooms in the fall, and shoots its seeds several feet with a loud snap. No other Canadian tree or shrub blooms in autumn.

Witchhazel is unmistakable in other ways (Fig. 6). The alternate, simple leaves are lop-sided with wavy edges instead of teeth — a combination not found in any other native shrub. The slender twigs are orange-brown and more or less downy, and bear hairy brown buds on short stalks. Often the tip bud is curved. Witchhazel flowers, which are golden and appear in tangled clusters of three in September or October, have strap-shaped petals.

The shiny black seeds take a year to mature. They are found in a brown capsule about the size of a large pea. Splitting four ways, the capsule ejects its twin seeds with a snap, apparently in much the same way a youngster shoots an apple seed by pinching it between thumb and forefinger. Dried empty capsules remain on the tree over winter, and help in identification. The bark is light brown, smooth or slightly scaly, and mottled.

Witchhazel is found over most of eastern North America. In southern parts it may grow to 25 feet high. In Nova Scotia it is more often a large shrub with crooked spreading branches, growing in clumps on moist sites in rocky woods.

Roland reports it as being common from Kings and Lunenburg Counties to Colchester County, but scattered westward and rarer eastward. Apparently it is absent from Cape Breton Island and Prince Edward Island.

Water diviners — people who claim to possess the ability to locate underground water — often choose a branch of this tree for the forked stick they use as an indicator.

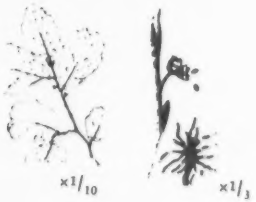


Fig.6 Witchhazel Features

THE ROSE FAMILY

This family of trees and shrubs deserves special mention because it is one of the most important to man. In Nova Scotia it accounts for over a dozen native and introduced trees and large shrubs. These are the various species of mountain-ash or rowan, cherry, hawthorn, serviceberry or shad-bush, Canada plum, pear, and apple.

Other members of the rose family are the apricot, peach and almond, along with such berries as strawberry, raspberry, loganberry, and blackberry. All have the common feature of five-petalled, usually showy flowers with combined male and female parts. Of the species described, only black cherry is valued for timber.

Black cherry, our largest native cherry, is common in southwestern Nova Scotia. In the central counties it is characteristic of rich or silty intervales, where it is mostly found mixed with other hardwoods. East of Antigonish it is rare, because Nova Scotia marks the northern limit of the natural range of black cherry. From Nova Scotia this species and its varieties range westward to the Great Lakes, down to Arizona, across to Florida, and southward in pockets through the mountains of Mexico and Guatemala.

It is too bad black cherry does not grow more abundantly in this province, for it yields one of North America's most prized furniture and cabinet woods. Sometimes it is cut locally for this purpose. A fast-growing tree on deep, rich soils, in the Appalachians it sometimes reaches 50 feet tall and 10 inches in diameter in 25 years. This rapid early growth drops off after the first three or four decades.

In Nova Scotia it normally reaches a height of 50 to 60 feet and a diameter of one to two feet. Usually it lives for 150 to 200 years.

When covered with blossoms it makes an excellent ornamental. Unfortunately, in these latitudes late spring frosts can damage the flowers before they open, cause newly set fruit to drop, and kill newly germinated seedlings. Rabbits and deer account for much damage to seedlings and sprouts, and birds and squirrels consume large quantities of the fruit.

In common with other wild and cultivated cherry species, black cherry twigs and foliage contain a compound which releases cyanic acid when eaten. Domestic livestock has been poisoned by it. Wilted foliage is slightly more toxic than fresh foliage. Another product formed simultaneously with the odorless cyanide is oil of bitter almonds, which is the characteristic odor of crushed cherry twigs. Symptoms of livestock poisioning include gasping and excitement. Deer can eat the foliage without ill effect. The fruit is harmless.

The familiar cherry cough remedies are made from the stewed bark of this species. So are tonic and sedative extracts. The fruit makes excellent jelly and wine. Appalachian pioneers sometimes flavoured their rum or brandy with it to make a drink called "cherry bounce"; hence the name "rum cherry" given to it in those parts.

A MEDIUM-SIZED TREE HAVING DARK, SHINY, FINE-TOOTHED LEAVES WITH A PAIR OF GLANDS ON THE STALK; REDDISH TWIGS WITH A BITTER ALMOND ODOR WHEN BROKEN; BEARING DARK RED CHERRIES IN AUTUMN.

Leaves Alternate, simple, glossy dark green above, paler below, with rusty brown hairs on the midrib near the base, and a pair of glands on the stalk; reddish twigs with a bitter almond odor; dark red cherries in autumn.

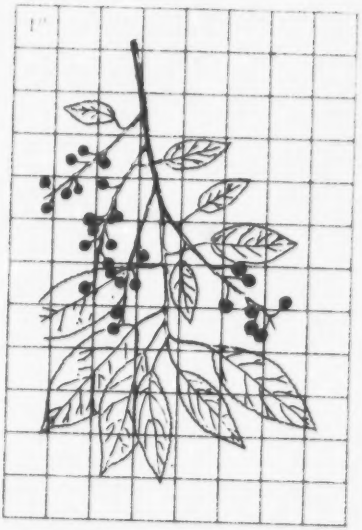
Twigs Slender, red-brown (often with peeling greyish skin); top bud pointed and larger than side buds.

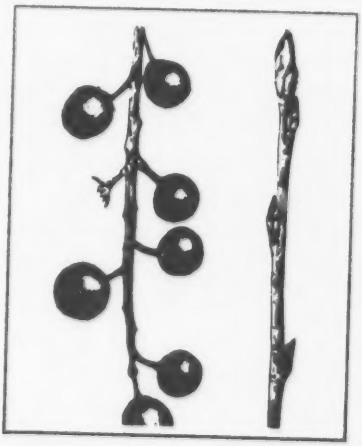
Flowers White, 1/4" wide, clustered on a drooping central stem, appearing when leaves half-grown.

Seeds Dark red, 1/3" cherries clustered on a central stem; juicy and edible but slightly bitter; with a rounded pit.

Bark Smooth, dark red-brown at first, with long whitish lines across it; becoming rough and finely scaly with age (similar to spruce but darker).

Wood Pale brown to dark red-brown, of average weight and hardness; has a pleasing grain, and takes a very fine polish; seasons easily, and takes glue well. Air-dry weight about 37 lbs./ cu. ft.





This handsome little tree is common throughout, especially on recent burns and cut-overs, on barrens, and in thickets along the edges of roads and fields. It prefers sandy soils, and cannot grow in heavy shade. The seeds being too heavy to blow on the wind like those of the willow, poplar, alder and birch species with which it is usually found, pin cherry must rely on birds and animals to spread itself. Because birds make it their business to scour newly opened areas for insects, they usually drop enough digested seeds to start a new crop — complete with fertilizer. This also explains the prompt appearance of cherry species along fences and hedgerows. Allister Fraser of Cape Breton cites evidence to indicate that these seeds may lie dormant for many years until fire cracks their hard shells. Early spring fires that barely burn the duff layer produce the best germination.

The various names of this species reveal its characteristics. "Fire-cherry" refers to its tendency to follow in the wake of fire. The nickname "hay cherry" takes note of the fact that the fruit ripen around haying time. "Bird cherry" recalls its dependence on birds for propagation, and its importance as food for birds: American researchers have found that it appears in the diets of at least 23 different species. And "pin cherry" is a reference to the arrangement of the fruit, which, unlike those of black cherry and choke cherry, resemble red hat-pins radiating from a pin cushion.

Pin cherry ranges from Newfoundland to eastern British Columbia and south through the Appalachians to Georgia. Mostly it is considered a forest weed, because when it reaches four to six inches in diameter and 10 to 25 feet in height, it dies. However, foresters value it as a pioneer species on newly cut-over land. The roots help hold bare soil in place, and its moderate shade protects the seedlings of more valuable species. The wood is sometimes used locally for fuel.

Some people transplant pin cherry to their lawns and gardens for its small stature, handsome bark, and crimson autumn foliage and fruit. Although the cherries attract birds, their flesh is too meagre to make them popular for wine or jelly.

Like other native and cultivated cherries, the twigs and leaves of pin cherry contain cyanic acid, and are poisonous. The fruit is harmless.

A fungus called black knot forms sooty, porous growths on the twigs and causes some damage. The best treatment is to remove the growths by cutting the twigs just below the infected parts.

A SMALL TREE HAVING SHINY LANCE-SHAPED LEAVES WITH TWO TINY GLANDS ON THE STALK; SMOOTH RED-BROWN BARK WITH ORANGE DASHES; RED TWIGS WITH CLUSTERED END-BUDS; AND SCARLET CHERRIES IN AUTUMN.

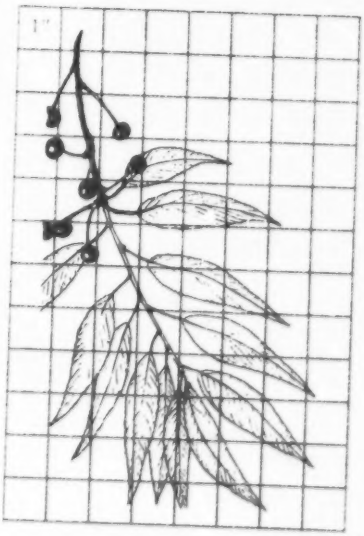
Leaves Alternate, simple, thin, bright shiny green above, paler below; hairless; a pair of tiny glands near base of leaf.

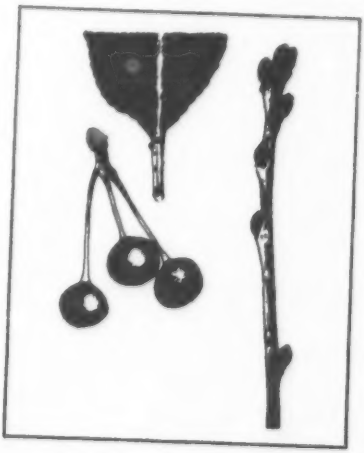
Twigs Slender, smooth, shiny red-brown, often with peeling greyish skin; buds tiny, rounded, with several clustered at twig tip; emitting almond odor when crushed.

Flowers White, about $^1/_2$" wide, in 4 to 5 flowered umbrella-type clusters (not on a central stem as in black and choke cherries.)

Seeds Bright red, in small clusters with the stems arising from one point (see choke and black cherry); edible, sour, with a rounded pit.

Bark Thin, smooth, dark red-brown with conspicuous raised orange lines across it when rubbed.





"It would be hard to find a more widespread and hardy shrub or small tree than choke cherry," writes Dr. W. M. Harlow in *Trees of the Eastern and Central United States and Canada* (Dover, 1957). This smallest of our three native cherries is usually considered a weed. Choke cherry and its varieties thrive in every part of North America except Mexico, Florida, and a few western states. Typically it will be found in sunny locations bordering meadows, streams, forest clearings, roads, fences, and rocky lake shores. In Nova Scotia it is more common in the northern parts, but occurs throughout.

As the name implies, its fruit tastes astringent or "puckery"; but cooking removes this quality entirely. Dr. Harlow quotes an early writer, Wood, as saying of it:

> *. . . they be much smaller than our English Cherrie, nothing near so good; if they be not very ripe, they so furre the mouth that the tongue will cleave to the roofe, and the throat wax horse with swallowing those red Bullies (as I may call them) being little better in taste. English ordering may bring them to be an English cherrie, but as yet they are as wild as the Indians.*

The pectin-rich fruit is often used in preserves and jelly, and makes an excellent red wine. After the first frost is the best time to pick it — but by that time birds have usually raided the trees.

The species is very frost-hardy. Prairie farmers often plant it for windbreaks. Its ability to root deeply and sucker freely makes it valuable for erosion control. Choke cherry also provides good cover and food for wildlife. Like black and pin cherry, it has poisonous twigs and foliage but harmless fruit.

INTRODUCED SPECIES

The genus *Prunus* includes plum, sloe and peach as well as cherry. Besides the three native cherry species, Nova Scotia has two or more introduced cherries, three introduced plums, and the imported sloe or blackthorn.

Information for identifying these and other introduced species may be found in any detailed handbook of northeastern flora, such as Roland's and Smith's *Flora of Nova Scotia*.

APPLE *Malus pumila* Mill.

Other common name: Wild Apple

Few people fail to recognize apple, winter or summer. Not many know that the tree we commonly call "wild apple", which is the parent of many of our cultivated strains, was originally introduced from Europe. (There are two native wild apples in Canada, but neither is native to this province.) Much planted in the early days, the cultivated strains have since escaped and gone back to the crabapple state which we call "wild apple".

A SMALL, OFTEN CROOKED TREE OR SHRUB HAVING BROAD DARK GREEN LEAVES THAT ARE WIDEST ABOVE THE MIDDLE, WITH A PAIR OF GLANDS ON THE STALK; BROWNISH TWIGS WITH POINTED BUDS AND BITTER-ALMOND ODOR, AND HANGING CLUSTERS OF PUCKERY RED CHERRIES IN LATE SUMMER.

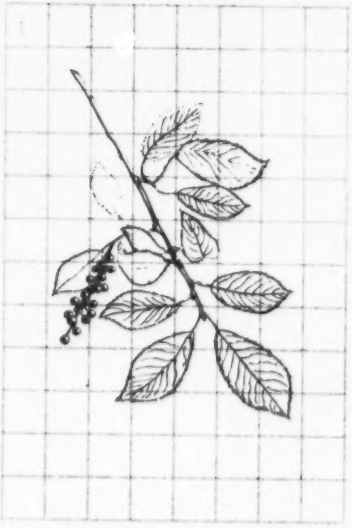
Leaves Alternate thin, dark green above; fine-toothed, paler and smooth below; wider above the middle, a pair of tiny glands just below the leaf.

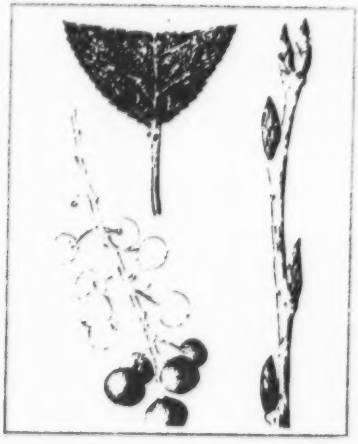
Twigs Brown to grey-brown, with pointed brown alternate buds covered by grey-edged scales; not clustered at the twig tip; with rank bitter-almond odor when crushed.

Flowers White, after the leaves, bisexual, in a cone-like cluster along an upright stalk.

Seeds Yellow to dark red, juicy, edible but astringent (puckers the mouth); arranged around a drooping central stalk; having a rounded pit.

Bark Thin, smooth, greyish without pronounced lines; roughened only on old trunks.





My father once watched a black bear climbing a mountain-ash to get at the ripe fruit near the top. When the bear was within reach of the tempting scarlet clusters, the branch he was on snapped and he tumbled to the ground. But the animal merely scrambled to its feet, grunted once or twice, and began again to climb the tree. This happened several times before he got his meal. It shows the tenacity of the black bear; it also shows how much they like mountain-ash berries.

This small, much-branched tree is not a true ash, but a member of the rose family. In Nova Scotia mountain-ash is common throughout in open woods, on rocky hillsides and along roads. Outside the province it ranges from Newfoundland to Manitoba and south to Tennessee. Its delicate leaves, showy white flowers and scarlet "berries" add interest to the countryside, and it is often transplanted as an ornamental.

About a dozen kinds of birds eat the fruits, which often stay on the tree all winter. In fact, birds are said to choose them over the fruit of European mountain-ash, when both are available. Weather prophets claim that an abundance of mountain-ash fruit means a mild winter ahead. To us the fruits taste bitter, but frost sweetens them slightly. They are said to be rich in iron, and are supposed to promote a good appetite. Well-aged "rowan-berry" or "dog-berry" wine is excellent. Deer and moose browse the twigs.

A similar native species is the showy or northern mountain-ash, commonly called dog-berry *(S. decora* (Sarg.) Schneid.*)*. Though not as common as the above species, it is scattered across the province, especially near shores.

The main differences between the species are that showy mountain-ash has larger fruits and flowers, and blunter, more boat-shaped leaflets with coarser teeth. The teeth seldom extend to the base of the leaflet as in American mountain-ash. However, these features are not always reliable, because the two species appear to intergrade.

A commonly planted ornamental is European mountain-ash *(Sorbus aucuparia* L.*)*, the true rowan of the Old World. From the Annapolis Valley to Amherst and Antigonish it is also a rather common escape along roadsides. Although the flowers and fruit are similar to those of the two native species, the leaflets are fewer, smaller, rounded at both ends, and seldom toothed below the middle. In winter the grey twigs can be identified by their small, white-downy buds.

The leaf-eating mountain-ash sawfly is a pest on all three species.

A SMALL MUCH-BRANCHED TREE BEARING COMPOUND LEAVES MADE UP OF 11 to 17 FINE-TOOTHED, LANCE-SHAPED LEAFLETS; FLAT-TOPPED CLUSTERS OF 1/4-INCH BERRIES: AND STOUT TWIGS WITH LARGE GUMMY BUDS.

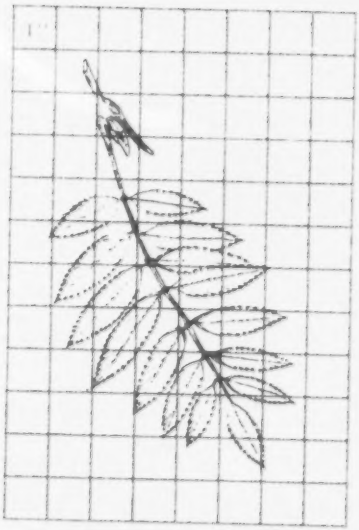
Leaves Alternate, compound 6″ to 10″ long, composed to 11 to 17 leaflets borne in pairs on a fairly stout stem; leaflets narrow and finely saw-toothed to or nearly to their bases, tapering for about two-thirds their length to a drawn-out, sharp point. Bright green above, paler and faintly hairy below.

Twigs Stout, smooth (sometimes slightly hairy), red-brown with whitish spots; buds large, purple-red, gummy; the tip bud 3/4″ to 1″ — about twice as big as the side buds.

Flowers June, after the leaves; in broad, flat-topped, cream-white clusters.

Seeds August or September; scarlet, 1/4-inch, berry-like; in flat-topped, often drooping clusters that may persist over winter.

Bark Thin, smooth; on young stems red-brown, turning grey on old stems.



72 SHADBUSH *Amelanchier wiegandii* Nielsen, *A. laevis* Wieg., and others.
Other common names: Wild Pear, Bilberry, Juneberry, Serviceberry

The shadbushes, of which the above two species commonly attain tree size in Nova Scotia, are so named because they usually bloom when the shad are running. Their narrow-petalled, white flowers make a striking display then. Since the several native *Amelanchier* species interbreed and the leaves on individual specimens vary greatly, it is hard to identify them with certainty.

The leaves of shadbush are small, fine-toothed, thin, and without glands. Those of *A. laevis* Wieg. are usually purplish when young. The winter twigs are slender, bearing long-pointed buds covered by loose, hair-fringed scales (Fig. 7). The bark is smooth and greyish, turning scaly on old stems. Shadbush berries are about $^1/_2$" long, dark purplish, sweet and fairly juicy, and topped by 5 withered flower parts. The leaves turn red to purple in autumn. Clearings and cutovers are their common habitat.

Fig. 7 Typical Shadbush Features

AMERICAN HAWTHORN *Crataegus flabellata* (Spach) Koch var: *flabellata*

Other common names: Thorn, May-apple

Of about seven native hawthorns, and two tree sized species, this is the only one abundant enough to include here. It is a bushy tree-shrub whose trunk and larger branches are often angled instead of rounded in cross-section, and whose twigs bear clusters of small, soft, scarlet, apple-like fruit containing several large seeds. The shiny red zig-zagging branchlets are armed with long sharp thorns (one to two inches long) along their sides. The leaves are glossy above and coarsely double-toothed (Fig. 8), and the flowers appear in white clusters. This tree is most common in western and central Nova Scotia, especially along rocky pastures, roadsides and in woodlots.

An introduced hawthorn commonly seen is the one-seeded hawthorn (*C. monogyna* Jacq.), sometimes called English hawthorn. This tree-shrub differs in several ways from the native species. Its leaves are smaller, darker and more deeply lobed, its winter twigs have the thorns on the tips of spur shoots, and its fruit are not multi-seeded. Both the native and introduced hawthorns commonly keep some of their fruit all winter. One-seeded hawthorn is most common in southern Nova Scotia, where it often escapes to roadsides.

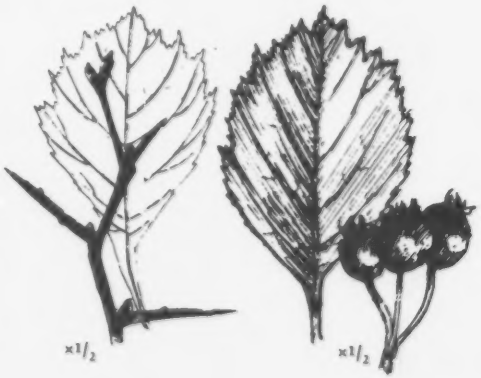


Fig. 8 Typical American Hawthorn Features

STAGHORN SUMAC *Rhus typhina* L.

Other common name: Sumac

Three things qualify this crooked little native tree or shrub for ornamental use: distinctive shape, handsome foliage, and bird-appeal.

In winter the stout, downy twigs and bare branches recall a spindly set of antlers "in velvet" — hence the name. Dark brown hairs fuzz the twigs, and the small scarlet "berries", which stay on the female trees all winter in large, upright cone-shaped clusters, are densely red-whiskered. The sexes are separate.

In summer the out-sized compound leaves give sumac a flat-topped look. These leaves are one to two **feet** long. They consist of 11 to 31 lance-shaped leaflets (up to five inches long) borne on a stout, hairy stem (Fig. 9). The color is dull dark green above and silvery below. The only other native tree with similar leaves is the American mountain-ash, but its leaf stem is hairless and its leaflets are pale green below. Two other differences are that sumac leaves exude a milky sap when broken, and its twigs have a soft white pith.

In autumn sumac puts on a spectacular display of flaming red foliage. Through late summer and winter, scores of different bird species feed on the fruit.

Fig. 9 Staghorn Sumac Features

Staghorn sumac ranges from Cape Breton Island to Lake Huron, and south through the Appalachians to Georgia. In Nova Scotia it is most abundant in the southwestern counties, becoming rarer eastward. It grows best in dry and rocky soils on open hillsides, along roadsides and in old fields.

Apart from its ornamental value, in the southern states this sumac was once a source of tannin. Also, the fruit was squeezed to make a refreshing drink called "Indian lemonade". Sucking the fruit cluster for its sour-apple flavor is said to be thirst-quenching too. The settlers, by punching out the pith from a twig, made a tube for sucking sap from sugar maples in spring.

Elsewhere the green-streaked, orange wood is sometimes sawn into lumber for decorative finishing and for wooden novelties. Rabbits eat the winter shoots. Finally, E. T. Seton says that a black ink can be steeped from the leaves and fruit. Dr. Harlow adds that the ink can be improved and kept mold-free by adding a few drops of iron (ferric) salt.

Sugar maple makes up only one-sixth of our hardwood forests, but it would be hard to do without. Its best growth occurs on rich, well-drained slopes in the Cape Breton, Cobequid and Musquodoboit uplands, and on the North and South Mountains of Annapolis Valley. Usually it will be found mixed with one or more of yellow birch, beech, red spruce, hemlock, white pine, balsam fir, and occasionally beech and red oak. Sometimes pure stands occur, especially on the tops of rounded hills.

Sugar maple can stand a great deal of shade. It matures in 200 to 300 years, and will grow to around 100 feet tall and two or three feet in diameter. Its native range is from Cape Breton to southeast Manitoba and south through the Missouri and Ohio watersheds to the end of the Appalachians in Georgia.

"What ash is to baseball," it has been said, "maple is to bowling." The latter refers to sugar maple, which is probably unexcelled as a long-wearing, high-gloss flooring material. This explains its frequent use in bowling alleys. Other uses include fine furniture, interior finish, vehicle stock, veneers and plywood, and sporting goods. Because of its excellent sound-enhancing qualities it is often used in musical instruments. From this tree also come fancy grain-patterns such as bird's eye and curly maple used in woodenware and furniture. Hard maple is also excellent for the fireplace or campfire. And of course a small local industry still centres around the spring tapping of this species for its sweetish sap, to make maple sugar and syrup. It takes about 40 gallons of sap to make one gallon of syrup. Indians first showed early French settlers in Eastern Canada how to tap the trees. The settlers also burned hard maple to obtain the potash needed to make soap.

The Bruce spanworm does some damage, as does also a leaf-browning disease called anthracnose. Since the 1970's widespread mortality of unknown origin has occurred; evidence points to acid rain and other pollutants.

A MEDIUM-SIZED TO LARGE TREE WITH SHORT TRUNK, BROAD DENSE OVAL CROWN OF WIDE 5-LOBED LEAVES WITH SCALLOPED EDGES AND FEW TEETH; SCALY GREY BARK, AND SHINY BROWN TWIGS WITH POINTED BUDS.

Leaves Thin, with 3 to 5 lobes separated by rounded "coves"; teeth few; dark green above, paler below; turning wine, scarlet, orange or yellow in autumn; opposite, simple.

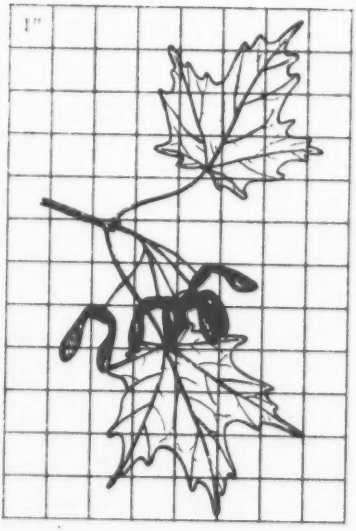
Twigs Slender, shiny, reddish-brown with whitish dots; buds opposite, sharp-pointed; leaf scars V-shaped.

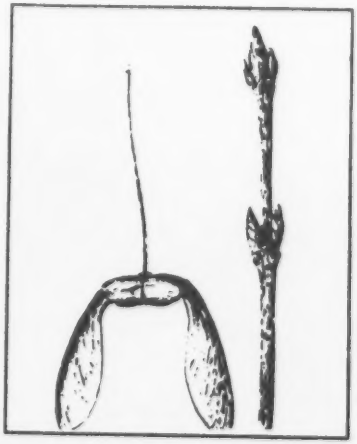
Flowers Yellowish clusters in May, with the leaves; some trees bearing only male, others with both male and male-female blossoms.

Seeds Clustered pairs (called "keys" or samaras) of red-brown, winged seeds, ripening and falling in autumn.

Bark Grey and nearly smooth on young stems, later splitting into deep vertical ridges that look like plowed furrows.

Wood Pale brown; hard, heavy, very strong (tougher than white oak); easily finished to a fine, highly-polished surface with a pleasing grain in flat-sawn stock; of high shrinkage, difficult to nail, slow to absorb preservatives unless pierced first. Air-dry weight about 47 lbs./ cu. ft.





It is the leaf of this maple that has long been Canada's emblem, although that of sugar maple is sometimes seen in designs. The Canadian flag shows a symbolic leaf combining the features of various maples. Actually, red maple is not found west of southeast Manitoba, whence it ranges south to Texas, east to Florida, and north to Newfoundland.

In Nova Scotia it is the most abundant hardwood, comprising almost one-third of the total hardwood volume. It grows almost anywhere, from swamps to dry and rocky uplands. Because it often invades recent cutovers or burnt land, red maple is probably on the increase.

The wood is used for the same purposes as sugar maple, and, except where strength, hardness or large size are critical factors, is generally sold with sugar maple. Red maple is also popular as an ornamental. But the branches are prone to breakage in sleet storms, and rot sets in rapidly where scars are not cleaned and painted. Its scarlet autumn display is unexcelled among native species.

According to one botanist, a permanent black dye can be made by adding aluminum salts to a hot-water extract of the bark. But more useful is the syrup that this species yields in the spring. Although the tree gives less than its larger cousin, early settlers tapped both maples when sugar was scarce. Deer and moose browse on the winter twigs.

A SMALL TO MEDIUM-SIZED, MUCH-BRANCHED TREE WITH GREY SCALY BARK AND UPTURNED BRANCHES; BEARING ORANGE FLOWERS IN SPRING, RED LOBED LEAVES IN SPRING AND FALL, RED SEEDS, AND DARK RED WINTER TWIGS.

Leaves Having 3 to 5 lobes with V-shaped notches and coarse sawteeth; green above, silvery green below; simple, opposite.

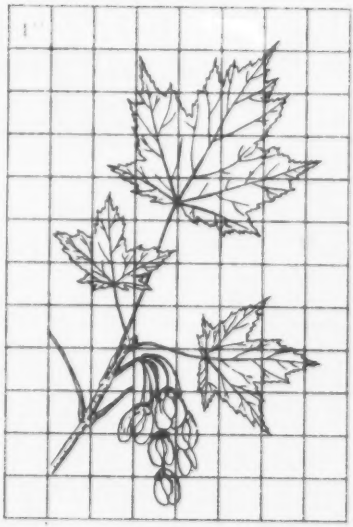
Twigs Slender, dark shiny red with whitish dots; buds opposite, rounded, dark wine with light-edged scales.

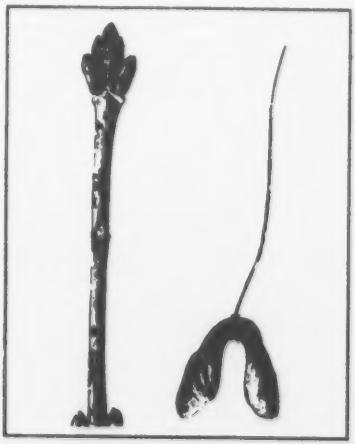
Flowers Orange or yellow, appearing before leaves from conspicuous, clustered oval buds on twig tips; single trees may be male, female, or male-female.

Seeds Clustered pairs of red to reddish-brown, winged seeds; ripening and falling in early summer.

Bark At first smooth, light grey or reddish brown; later dark grey, brown with long narrow platy scales.

Wood Moderately hard, not strong, similar to sugar maple wood but with a greyish cast. Air-dry weight about 38 lbs./ cu. ft.





MOUNTAIN MAPLE *A. spicatum* Lam.

Other common names: White Maple, Whitewood, Dwarf Maple

This smallest of eastern maples is unusual in that its yellow-green flowers appear in an erect conical spike (hence the Latin *spicatum*), with the male blossoms around the top and the female around the bottom. The female flowers develop into small pairs of samaras which as they ripen change from scarlet or yellow to brown. They fall in September.

Mountain maple is also known by its three-lobed (sometimes five-lobed), coarsely toothed leaves, which have wrinkled vein patterns on the upper surface and are slightly hairy and paler below (Fig. 10).

In winter the species is known by its slender and brittle red twigs and their stalked opposite buds. Another useful identification feature at this season is the presence of a grey down on the last inch or so of the twigs. The thin bark is greenish and smooth when young, becoming red-brown or grey-brown and furrowed at maturity.

Mountain maple grows in shady spots on moist rocky slopes and flats, and along streams and moist roadsides, rarely reaching a height of 25 feet. It ranges from Newfoundland to Saskatchewan and south to North Carolina. On the highlands of northern Cape Breton it is especially abundant. Often it is found with striped maple. Deer and moose browse them both at all seasons. Ruffed grouse are fond of the winter buds. Though not big enough for any commercial or domestic use, the species is important in preventing erosion of steep banks and slopes.

Fig. 10 Mountain Maple Features

STRIPED MAPLE *A. pensylvanicum* L.

Other common names: Moosewood, Moose Maple

Striped maple gets its common name from the conspicuous vertical white stripes on its smooth greenish to brownish bark. Another distinctive feature of this small, much-branched tree-shrub is its large pale, three-lobed leaf featuring drawn-out tips (Fig. 11). The yellow flowers, unlike those of mountain maple, are arranged in long drooping clusters. Usually the male and female flowers are on different trees. The samaras are greenish, and the seed cavity is pitted on one side.

Like mountain maple, moosewood is found throughout the province, though not as abundantly. It prefers cool, rich, shaded slopes, especially with yellow birch, beech, other maples, red spruce and hemlock. As food for wildlife and as a soil stabilizer, it serves the same purposes as mountain maple.

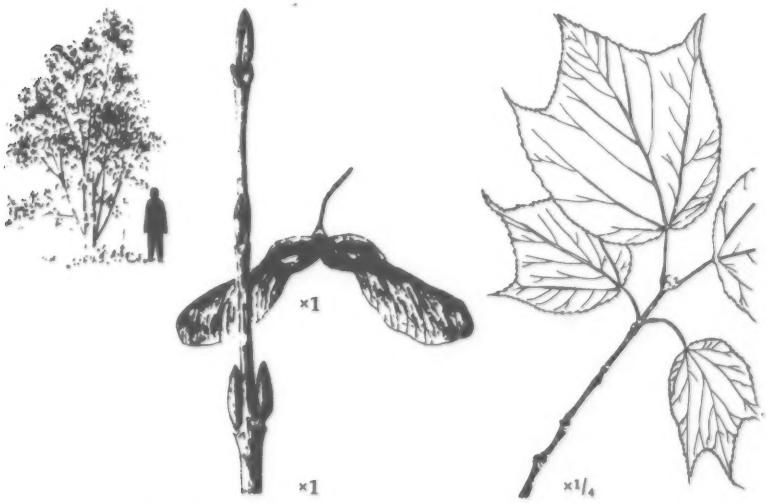


Fig. 11 Striped Maple Features

INTRODUCED MAPLES

At least four introduced maples are seen in the province (Figs. 12 to 15). Two are North American species and two are European species. The two North American imports are silver maple (*A. saccharinum* L.) and Manitoba maple (*A. negundo* L.). The two exotics, from Europe and Asia, are Norway maple (*A. platanoides* L.) and sycamore maple (*A. pseudoplatanus* L.). Other Eurasian species may be present too.

SILVER MAPLE A medium-sized to large tree with 5-lobed, deeply U-notched opposite leaves that are bright, shiny green above and silvery-white beneath; shiny red to orange-brown twigs that give off a disagreeable odor when crushed; and smooth to furrowed greyish bark. A handsome ornamental, but prone to storm breakage. The range is from southwestern New Brunswick through southern Ontario and most of the eastern United States.

Sometimes silver poplar is called "silver maple" because its leaves look similar, especially when seen from a distance on a windy day.

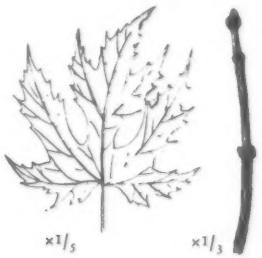


Fig. 12 Silver Maple Leaf and Twig

MANITOBA MAPLE This much-branched, smallish tree is the only Canadian maple with a compound leaf. The resemblance of this leaf to that of elder (*Sambucus* spp.), and the fact that elsewhere its wood is used for making boxes, accounts for the alternate name box-elder. The unique opposite leaves often have lobed lower leaflets. The smooth twigs are usually greenish (often with a whitish coating) and have downy, bluish-white buds. The range includes the prairie provinces and most of the United States.

Fig. 13 Manitoba Maple Leaf and Twig

NORWAY MAPLE This tree might be thought of as the European counterpart of our sugar maple. Both are similar in general appearance, and both are valuable timber species. But in North America we value Norway maple for its ornamental excellence. As a shade tree it is not only handsome, but its resistance to smoke, dirt, fumes, insects and disease makes it ideal for street planting. In Nova Scotia it is very popular. Distinguishing features include the thin, long-stemmed leaf with usually seven lobes instead of five, the milky sap exuded when a leaf is crushed, and the fact that the two halves of the winged fruit extend almost in a straight line (Eastern maples have their samaras joined at angles of not much over 90°). The winter twigs are stout, with a large red terminal bud and close-pressed red side buds.

Fig. 14 Norway Maple Leaf and Twig

SYCAMORE MAPLE Also called planetree maple, this large native of Europe and Asia may occasionally be seen along our streets. It is not as hardy as Norway maple. Distinguishing features are the coarsely round-toothed, five-lobed leaves, dark green with sunken vein lines on the upper surface and pale green below; the stout twigs with divergent green side buds and large green tip bud; and the 3″ to 7″ hanging clusters of yellow-green flowers.

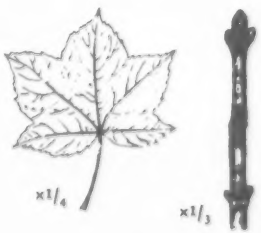


Fig. 15 Sycamore Maple Leaf and Twig

To rephrase the statement made about sugar maple, ash is to baseball what maple is to bowling. Good baseball bats and good hockey sticks are usually made from ash wood.

The reason is that ash bends and absorbs shock well without breaking. These traits made it ideal for long-handled tools, and for bentwood construction in furniture, wagons, snowshoes and tennis-racket frames, boatbuilding, barrels, trunks, and so on. It was once used in the framework of aeroplanes and automobiles. Of the four native ashes in Canada and the three in Nova Scotia, white ash has the finest wood.

This ash ranges from Nova Scotia to Minnesota and south to the Gulf states. Though scattered throughout Nova Scotia, it is most common in the central parts. The species prefers deep, moist soils on lower slopes and along streams, and is always found mixed with other species such as beech, birch, maple and hemlock. Its handsome bark and foliage make it a fine ornamental.

The winged seeds may travel up to 450 feet from the parent female trees. They germinate best on moist, fertile soil in sunny locations without plant competition.

Early growth is rapid. Open-grown saplings may reach a height of five or six feet in three to five years, and sprouts from young trees may grow five feet in their first year. In this province white ash grows to 60 feet or taller, and two to three feet in diameter.

Shaded side branches soon drop off, leaving a clean bole. This species can withstand shade in youth, but less as it matures. White ash develops a straight trunk with few branches below the main crown. In the open, however, old trees may spread their crowns as widely as any elm.

White ash seeds are eaten by purple finch, pine grosbeak, wood duck and other birds. The shoots are browsed by beaver and deer, and cattle relish them. Porcupine like the bark. Among insect enemies, the forest tent caterpillar does some damage.

A noted botanist says that itching from mosquito or bee stings is promptly relieved by rubbing the spot with a fresh white ash leaf. A good remedy — if white ash trees were as plentiful as mosquitoes!

A MULTIPLE-LEAFED TREE OF MEDIUM TO LARGE SIZE WITH STALKED, HAIRLESS LEAFLETS, FINELY FURROWED ASH-GREY BARK, WINGED PADDLE-SHAPED SEEDS, AND STOUT GREENISH WINTER TWIGS WITH DARK OPPOSITE BUDS AND PROMINENT V-NOTCHED LEAF SCARS.

Leaves Compound, opposite (ash and maple are our only native trees with opposite buds and leaves); 8" to 12" long, made up of 5 to 9 smooth, sparsely toothed leaflets; dark green above, paler below.

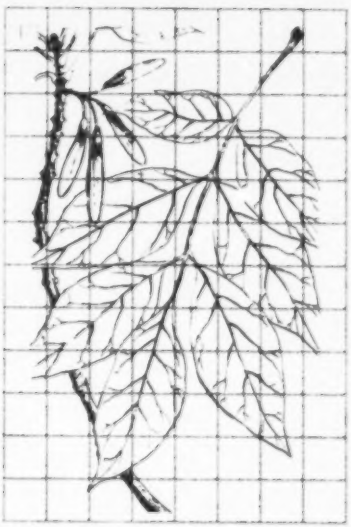
Twigs Stout, smooth, lustrous, with a jointed appearance; grey-green to brown-green, bearing dark brown buds above conspicuous, V-notched (think of the double-V in W) leaf scars (black ash leaf scars are flat to slightly U-shaped on top).

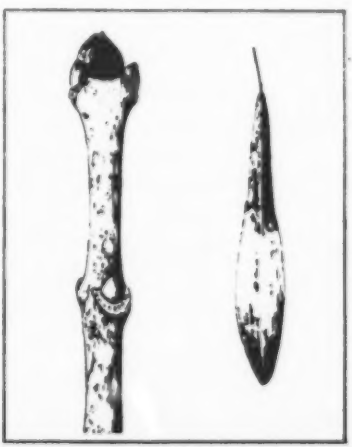
Bark Smooth, sometimes with an orange cast on young stems; otherwise ashy grey; developing a fine diamond-shaped network of interlacing, flat-topped ridges.

Flowers With or before the leaves; male and female on different trees; borne in stout clusters near the branch tips.

Seeds With a thin wing at one end (see black and red ash); in clusters that often stay on the tree into winter, rustling in the wind.

Wood Heavy, hard, and very tough; pale brown with lines of open pores along the growth rings, which are usually wider than in black ash. Air-dry weight about 44 lbs./ cu. ft.





When northeastern Indians or settlers wanted to make a pack basket, they looked for a black ash. After soaking the barked log in water they would pound it with wooden clubs until flat, thin slats could be peeled off. These they would split and fashion into strong baskets. Indians still do this when making their colorful basketware for the tourist trade. The dyes they use are no longer all natural, but the wood is nearly always real black ash. However, suitable trees are getting harder to find in Nova Scotia.

Two features account for the popularity of this ash for basketry. One is that, like all ash species, its annual rings have conspicuous lines of open springwood vessels or pores. On a clean-cut stump or log face these openings appear as concentric circles. They weaken the wood crossways, causing the yearly layers to separate like onion layers when softened and pounded. The second feature is that black ash, unlike other ashes, is by nature a slow-growing tree. This means that the lines of weakness occur close together — which is ideal for peeling off the thin slats needed for baskets.

Modern veneer-making employs a similar process, except that a fixed blade slices from the spinning log a uniform sheet of wood, regardless of the position of annual rings.

Black ash is a tree of open wet places, just as birch is a tree of open drier places. Like white birch it is intolerant of shade. It grows in openings along the margins of swamps and streams, or near springs. The shed seeds often lie dormant for a year or more before germinating.

Common associates are red maple, speckled alder, willow, fir or cedar. Heights of 40 to 50 feet and diameters up to a foot or so are average. The root system, in keeping with its preference for areas of high water table, is very shallow. The trunk is seldom as straight as that of white ash.

In Nova Scotia black ash is most common from Digby and central Lunenburg Counties to northern Cape Breton; elsewhere it is scattered or rare. Its North American range centers on the Great Lakes, extending from western Newfoundland across Anticosti Island to southeast Manitoba, and south to pockets in the mountains of Kentucky and Virginia.

Because of its scarcity in this province, the wood has never been commercially important here. Elsewhere it is used, in the better grades, for the same purpose as white ash lumber. Because of its more handsome figure the wood is even preferred to that of white ash for certain purposes such as cabinetwork and interior trim. But in strength it is much inferior to the wood of the other native ashes.

A SMALL TO MEDIUM-SIZED SLENDER TREE OF WET GROUND, BEARING COMPOUND LEAVES WITH NARROW, STALKLESS LEAFLETS: GREY TWIGS WITH NEARLY BLACK BUDS ABOVE UNNOTCHED LEAF SCARS; AND WINGED PADDLE-SHAPED SEEDS WITH THE WING ENCLOSING THE SEED.

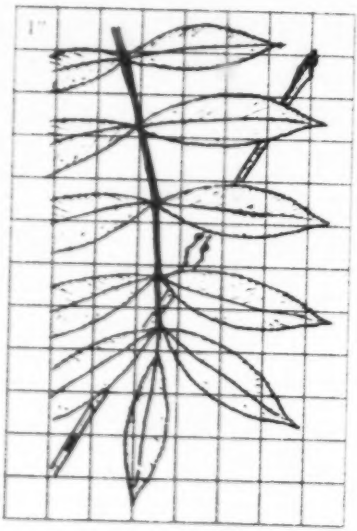
Leaves Opposite 10" to 16" long, compound, composed of 7 to 11 stemless narrow leaflets with fine teeth and tufts of hair along mid-vein below; dark green above, paler beneath.

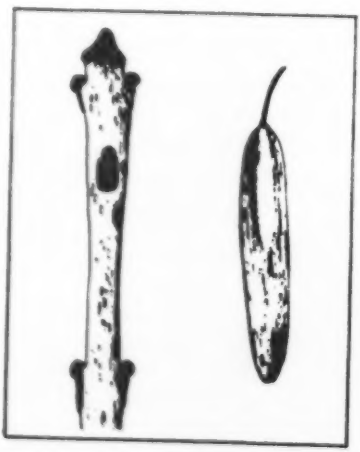
Twigs Stout, smooth grey; somewhat flattened at the joints; with opposite, nearly black buds, the tip bud conical; leaf scars level to slightly concave across the top, marked by a curved line of dots (about 16).

Flowers September, in oblong samaras with wing completely enclosing the seed; shed in late autumn or early winter.

Bark Smooth and grey, becoming slightly roughened to shallow-furrowed (but without diamond-shaped pattern).

Wood Whitish to dark brown, with close growth rings marked by rings of open pores; moderately heavy and hard, not nearly so strong as white ash, but with a more pronounced grain; takes a good finish. Air-dry weight about 35 lbs./ cu. ft.





RELATED AND INTRODUCED SPECIES

Northern red ash (*F. pennsylvanica* Marsh. var. *austini* Fern.) is rare in Nova Scotia, but is sometimes seen with black or white ash. It resembles the latter in having broad, stalked leaflets, but its leaflets are pale yellow-green and have hairy stalks and abundant teeth. Also, a velvety hair covers the twigs, buds, and main leaf-stalks, and the mature bark is a red-tinged brown.

OTHER INTRODUCED SPECIES

In this booklet introduced species have thus far been described along with their native relatives. However, certain commonly seen exotic species lack any close local relatives. Brief descriptions of some of these exotics follow.

LINDEN *Tilia europaea* L.

Other common names: Basswood, European Linden, Lime

This large tree has a dense crown of broadly heart-shaped, long-stemmed, two-inch to four-inch leaves growing in two rows along the twig. The twigs are zig-zagged and brownish, with distinctive shiny red to pale green buds covered by only two or three scales, of a texture and color like apple skin. The leaves and buds are lopsided in appearance (Fig. 16).

An odd feature of this tree is that its small, rounded grey fruits are borne in clusters on a stalk attached along half its length to a strap-shaped papery blade. The blade serves as a wing or parachute when the fruits drop in late summer.

Apart from the value of lindens as ornamentals, bee-keepers sometimes plant them near hives because the late-blooming, pale yellow flowers provide a good source of honey after clover goes to seed.

This tree has a very similar North American counterpart, namely American basswood (*T. americana* L.). Basswood ranges from Lake Winnipeg to Tennessee and north to the Saint John River Valley of New Brunswick. Doubtless it would thrive in Nova Scotia. Its leaves are nearly twice as large as those of the European species.

The linden family, which is mainly tropical, includes many valuable timber species. Rope was once made from the tough and fibrous inner bark or *bast* (hence *basswood*). Bast fibres from several tropical herbs of the linden family yield jute for burlap bags and cordage.

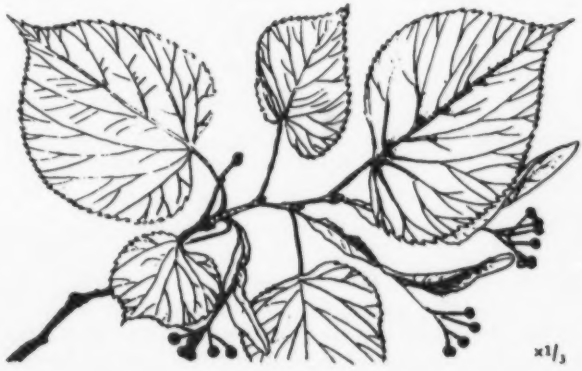


Fig. 16 Typical Linden Features

HORSE-CHESTNUT *Aesculus hippocastanum* L.

Seven leaflets arranged like the fingers of a hand are the best summer guide to this medium-sized to large ornamental from the Balkan peninsula (Fig. 17). Another distinctive feature, at least in June, is its showy upright cone of white blossoms (pinkish to red in one variety). In winter the very stout twigs are a sure guide. They have pronounced horseshoe-shaped leaf scars (with five dots each for nails), and large, gummy, blackish buds.

Most children know the shiny brownish-black nuts of this shade tree. They grow encased in a spiny bur as big as a golf ball. Though not edible like real chestnuts, the nuts are good for various games. One such game consists of swinging a nut on a string and trying to gain points by cracking an opponent's without getting entangled.

One writer claims that the meat of horse-chestnuts, when ground to a flour, will make a book paste that repels the ticks which sometimes destroy book-bindings in libraries. The fresh seeds are thought to be poisonous.

Fig. 17 Horse-chestnut Feathers

LOCUSTS

Two species of locust are frequently seen in the province, especially in the western counties, where they have been commonly planted as ornamentals. They are black locust (*Robina pseudoacacia* L.), and clammy locust (*R. viscosa* Vent.). A third, bristly locust (*R. hispida* L.), is only found south of Wolfville, according to Roland and Smith.

Black locust is a large ornamental with fern-like, blue-green compound leaves, paired spines, fragrant blossoms and bean-like pods (Fig. 18). It is native to the Appalachian and Ozark Mountains. The sharp $^1/_4$-inch spines occur just above where the leaf stalk joins the twig. Locust twigs are red-brown, somewhat zig-zag, and angled in cross-section. When old the tree has deeply-furrowed, dark brown bark, looking almost as if rough old rope had been braided and interlaced up and down the trunk.

Where black locust is more plentiful its durable wood is much used for railway ties, fence posts and insulator pins. In Nova Scotia, its very fragrant white "sweet-pea" flowers and handsome foliage made this species one of our most popular ornamentals in years past.

Clammy locust is a small introduced relative that is often seen in clumps or thickets in the Annapolis Valley. Its leaves are similar to those of black locust, but the twigs are sticky and the flowers rose-purple.

Honey-locust (*Gleditsia triacanthos* L.), a relative of the true locusts, is occasionally seen. Also imported from the south-central United States, this large ornamental has leaves resembling those of black locust, except that they are usually doubly compound (i.e; arranged as if a number of compound leaves were spaced along one stem), and the leaflets are smaller. Other differences are its large usually three-branched thorns (hence the Latin *triacanthos*) and its huge (up to 18 inches long) shiny seed pods. The flowers are small and plain. Nurseries usually sell thornless, seedless varieties of this hardy species.

The locusts and honey-locusts are members of the bean or pea family.

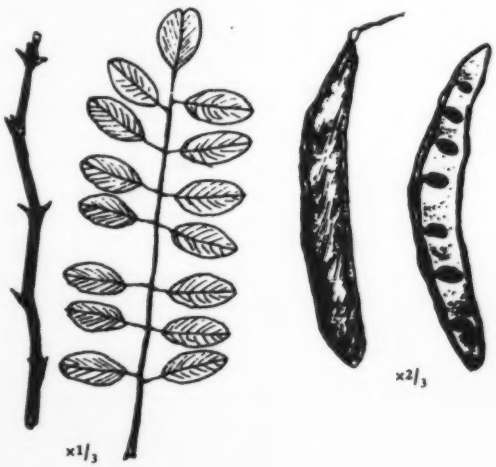


Fig. 18 Black Locust Features

a walk in the woods

WHERE TO LEARN MORE ABOUT TREES

Many fine books and publications are available to the person who desires to go deeper into tree study. One of the best is the profusely illustrated paperback *Native Trees of Canada*, which can be ordered through a local bookstore. For an excellent account of forest zones from coast to coast, see J. S. Rowe's *Forest Regions of Canada*, from the Canadian Government Publishing Centre, Ottawa. Less expensive but quite good is Hosie and White's *Forest Trees of Ontario*, published by the Ontario Ministry of Natural Resources, Toronto, Ontario. The United States Department of Agriculture, Forest Service, puts out a great deal of useful information about trees. For titles and prices, write the Superintendent of Documents, Washington, D.C. 20402, U.S.A.

Another excellent guide is W. M. Harlow's pocket-sized paperback *Trees of Eastern and Central United States and Canada* (Dover Publications Inc., New York). Golden Nature Guides' booklet *Trees* by Zim and Martin is also useful, and is found in most book stores. For fascinating general information about the forest community, *The Forest (Life Nature Series)* is a good source. Check with a local library or bookstore for this. And Hugh Johnson's *The International Book of Trees* is superb.

For more detailed guides to Nova Scotia woody plants, including trees, two booklets are available free from the Nova Scotia Department of Lands and Forests. They are *Summer Key to the Woody Plants of Nova Scotia* (Bull. No. 16), by A. E. Roland and D. A. Benson; and *Identification of Nova Scotia Woody Plants in Winter* (Bull. No. 19), by J. F. Donly. Finally, for a thorough treatment of the whole Nova Scotia flora, *The Flora of Nova Scotia* by A. E. Roland and E. C. Smith is recommended. It is available from the Nova Scotia Museum, Halifax.

However, useful as books on trees may be, there is nothing like studying trees in the field. Parks sometimes display labelled trees to aid the beginner. The Public Gardens in Halifax are helpful in this respect. Also, museums sometimes show exhibits of leaves, twigs, seeds, wood samples and such that clarify points for the amateur. A notebook for personal observations is valuable.

Some people find it useful to carry a magazine or catalogue on their strolls for protecting their finds until the specimens can be properly dried between newspapers and later taped or glued to stiff, labelled cards for a permanent record.

And there remain, of course, one's travels. When in a new area, watch for new species. In most cases previous experience will enable one to place it in the correct group — maple, elm, pine, and so on. From there, a good local bulletin will lead to the correct name.

Happy tree-hunting!

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